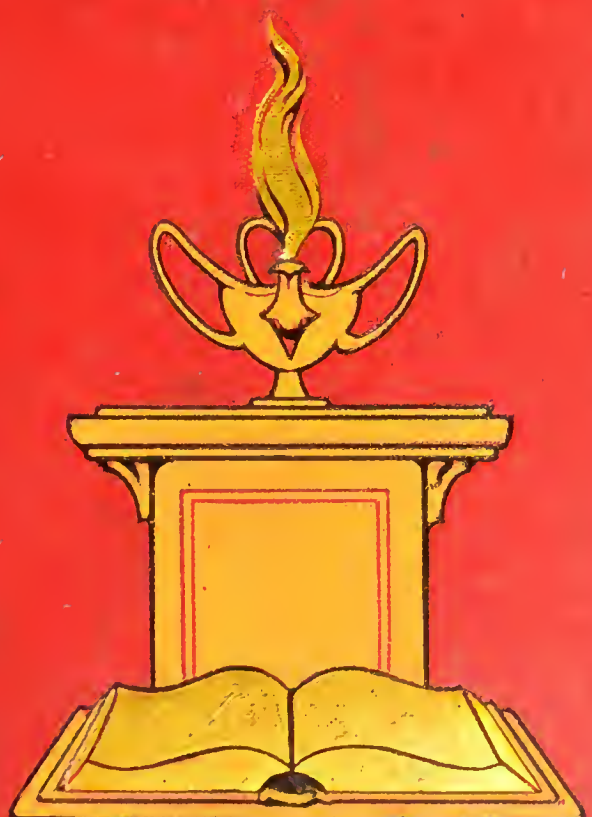
THE SCHOOL OF HEALTH



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THE SIMPLE LIFE.

THE
SCHOOL OF HEALTH.

A Guide to Health in the Home.

Containing the Elementary Facts of Physiology, A Practical Course in Physical Culture, Instruction in Healthful Cookery, and Directions for the Home Treatment of the Most Common Diseases.

By Alfred B. Olsen, M.D.,

. . and .

M. Ellsworth Olsen, M.A

Editors of "Good Health."



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Preface.

IN making this slight contribution to popular health literature, it has been the writers' aim to set forth in a simple, helpful way some of the broad, fundamental principles underlying bodily health, and to urge obedience to them, as well as to give such general information relating to the care of the sick as will contribute to the efficiency of home nursing. As there is scarcely a home in these days but has its occasional invalid, the intelligent care of the sick is a subject which cannot well be overlooked in a work dealing with the people's health.

If, as the result of perusing this book, the reader's knowledge of important physiological laws is broadened, and his purpose strengthened to take earnest care of his vital organs, with a view to attaining the highest degree of health and usefulness; if the homes which the little volume enters are made sweeter and more wholesome, and the children gathered about the family hearth are better fed, clothed and cared for; if the housework is done with fewer backaches, and the roses bloom a little longer in the cheeks of the wife and mother; and if the head of the household finds himself carrying his necessary burdens with greater freedom and ease as the result of the adoption of health principles—then the mission of "The School of Health" will have been abundantly fulfilled. The writers can only hope that the book will not wholly fail of its purpose.

It is a pleasure to acknowledge the great help derived

from the writings of Dr. J. H. Kellogg, especially from his monumental work, "Rational Hydrotherapy." Dr. Robert Hutchison's excellent book on "Food and Dietetics" has been freely consulted in the preparation of the chapters relating to food matters. Dr. J. J. Bell, of Rostrevor, Ireland, and Dr. Franklin Richards, of Leicester, have kindly taken pains to read the book through in manuscript, and have offered valuable suggestions.

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Introduction.

IT is said that Michael Angelo, when an old man, was seen one day wandering among some ruins in the vicinity of Rome. Asked what he was doing, the great artist replied: "I am going to school." The answer was a worthy one, and strongly suggestive of the perennial freshness, the childlike humility and receptiveness of a truly great mind.

It is in this same spirit that the subject of health and healthful living may be approached to the best advantage. We need to sit at the feet of nature and learn of her in all patience and humility the lessons she has to teach. Health is much more largely a matter of education than people realise. Heredity cuts a comparatively small figure. Locke was wont to affirm that nine men out of ten were what they were, good or evil, useful or not, by their education. Even so is it true that the vast majority of individuals are strong and healthy, or weak and ailing, according as they have trained themselves for the one or the other condition.

Ignorant violation of physical law is the cause of nearly all the diseases with which humanity is afflicted. Ignorance was a chief factor in bringing about those peculiar conditions which culminated in the Dark Ages. Ignorance lies at the root of some of the most distressing social evils of to-day.

It is not mere vulgar ignorance that has wrought so much evil. There was abundance of knowledge of a certain kind, and no little culture, during the Middle Ages; but of the laws regarding sanitation and the preservation of health, kings and peasants alike stood in almost complete ignorance, and we see the inevitable result in those terrible visitations of plague and small-pox and other diseases which, time and again, swept over Europe.

The situation is much better to-day as regards public sanitation (though much remains to be done even in this department); but we still have with us an amount of ignorance concerning personal hygiene which is appalling. It is hardly considered proper to know anything about one's physical organs. Hence we have young men and women who are almost as ignorant of the simple facts of physiology as young savages, and much less able to take care of themselves physically. In the presence of sickness they are simply dumbfounded. These young people marry and bring children into the world without realising the responsibilities of fatherhood and motherhood, or knowing the first principles of child culture. Is it any wonder, then, that there should be so many little green mounds in our cemeteries? Can we consider it at all strange that in some populous districts half the babies die before reaching the age of twelve months?

Not only do children suffer from want of proper care; but the parents are destroying their own health by injurious practices. Sad to say, it is the exception rather than the rule to meet an adult man or woman who has a perfectly sound physique. Nearly all have their weaknesses, many are afflicted with diseases of a more or less serious nature. Hence the enormous con-

sumption of patent medicines of every conceivable variety, and the ever-increasing work of the hospitals, which treat millions of cases every year.

All these things, and much more that might be said, go to show the public need of education and training in health principles, a need which it is hoped this book will help in some small way to supply. It is called THE SCHOOL OF HEALTH because it is intended to be educational in the truest sense of the word. It is, if the reader pleases, a kind of "School for Adults." The plan of the book is to give a concise and yet fairly comprehensive survey of the most fundamental principles relating to the care of the body in health and in disease. The contents of the book, though variously disposed in chapters, may be summed up under four general heads, namely:—

1. *Physiology.* The first chapter of the book is devoted to a consideration of the structure of the body and the use of its various organs. Without traversing the ground of an ordinary school text-book in physiology, this part of the work aims to give a practical knowledge of some of the most vital physiological truths, and its careful perusal will be a help to the understanding of the simple treatments described in subsequent chapters.

2. *Hygiene.* How is the health of the body best maintained? What habits of eating, drinking, dressing, and working conduce most powerfully to the upbuilding of strong, vigorous health? Again, what is necessary to the practical carrying out of such instruction? How may food be prepared, that will be at once pure, nourishing, palatable, and not too expensive? What guiding principles should be followed in the conduct of

the household affairs? These are some of the questions which receive consideration under the general head of Hygiene.

3. *Natural Remedies for the Sick.* Unfortunately disease is an unwelcome guest in almost every home. A book on health would therefore be incomplete without giving some instruction concerning its treatment. One fundamental principle is emphasised all the way along, namely this, that disease in general is the result of a wrong way of living, and its successful treatment is impossible without change of habits. But when disease conditions have existed for a long time, merely desisting from the habits which induced them is not always sufficient to bring about a cure. Here, then, we see the need of the application of simple natural remedies by which we may, as it were, co-operate with nature in bringing about the cure. Hydrotherapy, having proved an especially effective means of such co-operation, naturally occupies a prominent place in this book. Electricity, massage, medical gymnastics, and other agencies of tried worth are also recommended, while great emphasis is laid on fresh air, pure food, and wholesome surroundings generally.

4. *Popular Errors Pointed Out.* Some attention has been given, moreover, to popular errors in diet, dress, and general habits which are believed to be especially productive of disease. In all these cases the plan has been to explain why a certain habit is harmful to the body, and to give suggestions that will prove helpful to those desiring to rid themselves of it. The position taken in each case has been the moderate one, no statements being made which cannot be backed up by abundant scientific proof. On the other hand, it has

not been thought right to exeuse or eondone eertain practiees merely beeause they happen to have attained wide popularity. Sineerity demands that the truth be told, even if it is disagreeable truth.

Sueh in short are the eontents of the book. A few words may be said in regard to its purpose. It aims to be a sort of text-book in health eulture from whieh any individual ean obtain the neeessary guidanee in a systematic course of physieal improvement. It would fain inspire in its readers a respect for their bodies as the Creator's ehief handiwork, and a determination not to abuse them in any way, but rather to develop their powers to the utmost. It would stimulate in every young man and young woman a noble ambition to arrive at eomplete physieal realisation—to cultivate not *bigness* so mueh as *health* of musele and soundness of all the organs of the body —to abhor stimulants and nareoties, to shun bad habits and fashionable dissipation, and to eount it a joy to render hearty obedienee to every natural law. With such ideals in the home, health would indeed spring forth speedily, and the elear, rosy cheeks, the sparkling eyes, the elastie step, and alert, vigorous earriage that we all so much admire would be very mueh more in evidence, and would make life in every way brighter and happier and more worth the living.

If one guiding prineiple be sought for upon whieh life can be remodelled, we commend the "*Simple Life.*" Get baek to nature. This does not mean to savagery; it does not involve renouneing all the eonveniences of twentieth century eivilisation; but it does mean to turn one's baek on the soul-deadening artificialities, and machine methods, and the mad feverish

rush after wealth which are eating into the very heart of present-day society. It means to cultivate simple, natural habits, and take one's recreations as far as possible out-of-doors.

Does anyone deny that it is possible to live the simple life under modern conditions? He is wrong. The simple life is the one life that is open to everyone to live; but the multitudes are so enervated by artificial and health-destroying habits that they seem almost powerless to adopt it.

The toiler in our large cities can live the simple life, or at least a modified version of it. He may be obliged to work in the city when he would rather be in the country; but his habits will be simple, his needs few and easily supplied; and when the hours of recreation come, they will not find him in a stuffy theatre or music hall, but out under the open heavens, drinking in the life-giving oxygen, and gathering strength for the task of the morrow. Circumstances may imprison him for a time, even as a cage the bird of captivity, but once the door is open, he is away to the fields and the woods which are his natural home.

Such in spirit is the simple life. That it is also a healthful and happy life, no one can doubt. When it becomes even so much as an *aspiration* in any home an important step has been taken towards higher things; when it is *realised*, it brings its own rich reward.

CHAPTER I.

The Human Body.

FEARFULLY and wonderfully made" is the comment of the Psalmist on the human body. As the crowning act of the Almighty, man stands at the head of all animal creation. To him alone is given full understanding and a true knowledge of right and wrong. He stands supreme on earth, where, from the beginning of his existence, he was given command of the lower creation.

The constitution of man is very complex, and most of the vital phenomena of the body are difficult to comprehend. Many are as yet unexplained. But there is much important knowledge to be obtained from a study of the body and the laws that govern its being. It is the purpose of this chapter to present some important facts regarding the structure and functions of the human body.

The Basis of Life.

Protoplasm, a semi-fluid, complex substance, is the basis of all life, animal or vegetable. A tiny bit of living protoplasm is called a cell. Each cell is an entity by itself and possesses the various essential functions of life. A tissue may be defined as an aggregate of similar cells. Various tissues are grouped together to form an organ, and an animal might be regarded as

a mass of organs correlated and working in perfect harmony.

Cells are microscopic in size, and may be of any conceivable shape. Liver cells are polyhedral in form; kidney cells may be flat or column-shaped; and lymph cells are spherical.

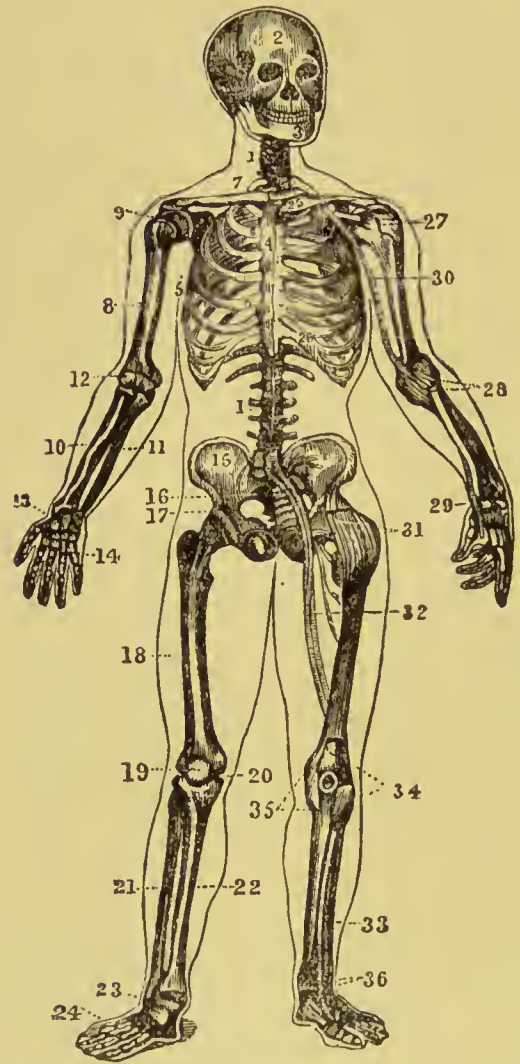


Fig. 1. Skeleton of a Man.

1. Spinal or vertebral column; 2. Skull; 3. Lower jaw-bone; 4. Breast-bone; 5. True ribs; 6. Costal cartilages; 7. First rib; 8. Humerus or arm bone; 9. Shoulder-joint; 10. Radius; 11. Ulna; 12. Elbow-joint; 13. Bones of the hand; 14. Finger bones; 15. Hip-bone; 16. Sacrum; 17. Hip-joint; 18. Femur or thigh-bone; 19. Knee-cap; 20. Knee-joint; 21. Fibula; 22. Tibia or shin-bone; 23. Ankle-joint; 24. Bones of the foot; 25. Collar-bone; 26. False ribs; 27. Shoulder; 28. Ligaments of elbow-joint; 29. Wrist-joint; 30. Artery; 31. Ligaments of hip-joint; 32. Artery and Vein; 33. Artery; 34. Muscle tendon; 35. Ligaments of knee-joint; 36. Ligaments of ankle-joint.

The lowest forms of both animal and vegetable life consist of single cells having a separate existence. They multiply by enlarging and then dividing into two daughter cells. The amœba is a good example of a one-celled animal, and makes a most interesting study under the microscope.

The Skeleton.

The framework of the body consists of a bony skeleton, composed of 200 bones, not reckoning the small bones of the ear. These bones

are joined together by tough, fibrous bands, the ligaments. The bones vary considerably in size and form. They may be long, like the thigh bone; short, like the wrist bones; flat, like the knee-pan; or irregular, like the jaw-bone.

According to distribution, the bones are classified as follows:—

Bones of the head, ...	22
Bones of the trunk, ...	52
Upper extremities, ...	64
Lower extremities, ...	62
	200

It will be noticed that the teeth are not included, for they are composed of much harder tissue than bone, and are really a specialised development of the skin.

Structure of Bones.

Osseous, or bony tissue, consists of a combination of both animal and mineral matter. The characteristic hardness of bone is due chiefly to the presence of the mineral salts, especially lime. The ground material consists of a dense, fine, fibrous substance in which is deposited the calcareous matter. It is interspersed with bone cells, which are distributed so as to form concentric rings or layers about longitu-



Fig. 2. Transverse section of bone as seen under the microscope.

a. Concentric layers of bone; *b*. Haversian canal: *c*. Bone cells; *d*. Interstitial layers.

Camden P.L.

dinal canals. These Haversian canals, as they are called, transmit blood-vessels, lymphatics, and nerves.

Most bones have a very hard, dense surface of compact bone, and a loose, porous interior filled with marrow. Long bones have a hollow shaft, called the marrow cavity. The red marrow, found in the ends or heads of long bones and in the interior of other bones, is the birthplace of the red blood-cells. They are constantly being formed to replenish the blood and maintain its efficiency.

Cartilage or Gristle.

Next after bone, cartilage is the toughest and hardest tissue of the body. There are three varieties. The ordinary form (hyaline cartilage) is most abundant and most widely distributed. It binds the ribs to the breast-bone, forms the rings of the wind-pipe, and covers the ends of bones. Elastic cartilage is less widely distributed. It forms the framework of the ear, an organ which must possess a large amount of elasticity. Fibrous cartilage is the toughest and hardest. It is found chiefly in membranous plates or discs which separate the vertebræ of the spine. Their presence permits a limited amount of movement between the vertebræ, which is desirable.



Fig. 3. Hyaline cartilage from the trachea.

The Joints.

Two or more bones meeting form a joint. Most joints permit of a certain amount of mobility. Joints may be roughly classified as follows, an example of each being given:—

1. Hinge joint, knee.
2. Ball and socket, hip.
3. Rotatory, radio-ulnar.
4. Gliding, breast-bone and collar-bone.
5. Mixed and immovable, bones of the skull are an example of the latter.

Some of the joints are quite simple, and others, like the ankle, very complex.

Ligaments.

What binds the bones together and holds them in place? The answer is, tough, fibrous bands and cords called ligaments. The muscles, too, help to hold the bones in place, but their chief function is to produce movement of the bones, and so perform labour.

Ligaments may be short or long, round like a cord, band-shaped or thin and flat. They are composed of white fibrous or elastic tissue, or a combination of both. Fibrous ligaments are very tough and possess practically no elasticity.

Skeletal or Voluntary Muscles.

Voluntary muscles are under the control of the will more or less perfectly. They consist of bundles of muscle fibres, each fibre being from one-eighth to two inches in length, and from one-thousandth to one-fourhundredth of an inch in diameter. A thin, but tough, fibrous membrane forms a strong sheath about each muscle. From the sheath fibrous membranes dip into the muscle, dividing it into compartments.

Muscles may be long, broad, or short, according to location and the purpose which they serve. They may be composed of very fine, delicate fibres, or large, coarse ones.

Function of Muscle.

Muscle is a highly developed form of tissue, which has the specialised function of *contraction.* When a muscle shortens, it also hardens, although the actual loss in bulk is so slight as to be practically negligible.

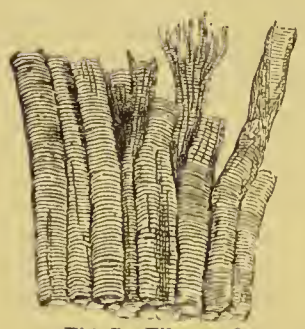


Fig. 4. Fibres of voluntary muscles.

The expression of the face is largely due to the action of the facial muscles. When one laughs, the corners of the mouth are pulled outward and upward by muscles, and the face appears to broaden. Another group of muscles pulls the corners of the mouth downward and elongates the face to produce the downcast appearance which is so characteristic of discouragement and sadness.

The muscles of mastication manipulate the jaw and thus grind the food between the teeth.

The muscles between the ribs, called the intercostal muscles, assist in breathing.

Each movable joint possesses at least two sets of muscles, flexors for bending, and one or more antagonistic muscles which produce extension of the joint.

The muscles play a very important rôle in the production of animal heat. This is readily demonstrated by the warmth which is quickly produced by

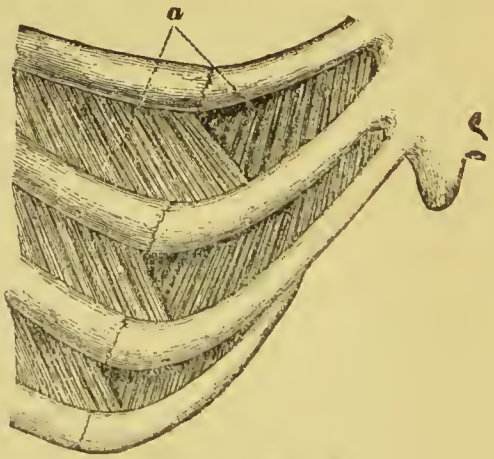


Fig. 5. Part of chest wall.
a. Intercostal muscles.

exercise or manual labour. The muscles form forty-five per cent. of the body mass, or almost half.

After death the muscles harden, causing the characteristic death stiffening or *rigor mortis*.

Involuntary Muscle.

Not all muscle is under the control of the will. One cannot, fortunately, control or influence the beat of the heart by merely willing to do so. Heart muscle is a special variety by itself, and is unlike any other muscle. It is composed of short, oblong, rod-shaped cells, with stubby branches.

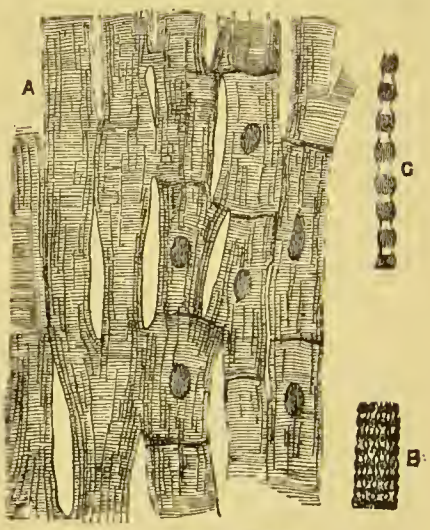


Fig. 6. Heart muscle.

a. Shows branching of the cells; *b*. Part of a cell highly magnified, and showing primitive fibrils; *c*. One fibril still more highly magnified.

Ordinary involuntary muscle, as found in the walls of the stomach or intestines, differs radically from skeletal muscle. Instead of long fibres, it is composed of exceedingly delicate, fine, slender, spindle-shaped cells, as shown in the adjoining illustration. Involuntary muscle contracts very slowly, compared with the voluntary form. The contraction travels downward from the stomach in the form of a wave of circular contraction, and this is known as peristalsis.



Fig. 7. Involuntary muscle cells.

Involuntary muscle is also found in the walls of the bladder, arteries, veins, wind-pipe and the other air-passages.

It is interesting to note that there are numerous small muscles in the skin which, in the presence of cold, contract, causing minute, pimple-like elevations, known as goose-flesh.

The Body a Living Machine.

The body is often likened to a machine, but the comparison is, at best, very inadequate. Like a machine it requires a certain amount of care and attention. Otherwise it gets out of order, or becomes sick, as we say. If properly cared for, it should always be in a healthy condition. To maintain sound health, the body must be furnished with proper and adequate nourishment. The food problem is of the greatest possible importance. Consider this matter for a moment. The body is made of the food we eat. The dinner of to-day is blood to-morrow, and as such nourishes the various organs and tissues of the body. Good food, well digested and assimilated, makes pure, nourishing blood. The food we take builds the body and repairs the waste resulting from the wear and tear of everyday life. It is essential that the waste should be made good promptly; otherwise the body would become emaciated and feeble.

When we speak of food we may use the term in the broadest sense, and include air and water, as well as bread and other more or less solid articles.

The Air We Breathe.

Air is not an element, as was once believed, but a mixture of several gases, chief of which are the following:—

Nitrogen, ...	79.15	volumes per cent.
Oxygen, ...	20.81	" " "
Carbonic acid gas, ...	.04	" " "

Of these gases, oxygen and carbonic acid gas especially concern us. Nitrogen acts merely as a diluent and is of no use to the body in its elemental form.

Oxygen is of the greatest importance. It supports life. Without it all forms of life, animal and vegetable, would soon cease to exist. Indeed, oxygen is the most important food of the body. We do without eating for a week or more; without drinking for several days; but we cannot live ten minutes without breathing.

How We Breathe.

Nature has endowed man and the higher animals with a special apparatus for receiving the air—the respiratory organs, which consist of a pair of lungs and certain passages leading to them. The lungs are situated in the chest cavity, where they encircle the heart. They are composed of a loose, porous, fibro-elastic tissue, which expands to receive the air, and contracting expels it.

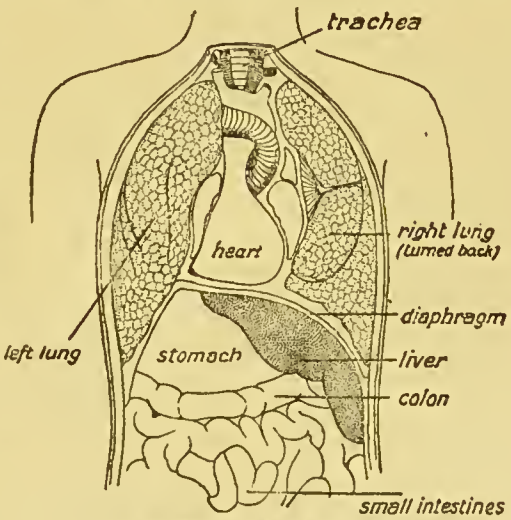


Fig. 8. Internal organs of chest and abdomen as viewed from behind.

The act of respiration is a double one—inspiration or taking in the air, and expiration or breathing it out. While within the lungs the air loses about one-fourth of its oxygen and gains an equal volume of carbonic acid gas. It is also charged in small quantities with various tissue wastes called organic extractives. The presence of the latter gives the exhaled air its foul smell.

The total capacity of the lungs is about 340 cubic inches. Of this amount 100 cubic inches always remains in the lungs, and cannot be expelled. It is called residual air. Another 100 cubic inches is usually in the lungs, but can be expired with an extra effort. The amount of air breathed under ordinary circumstances is small — only about 20 to 30 cubic inches. But with an extra effort one can take in an additional 110 cubic inches, making in all 340 cubic inches. See accompanying diagram.

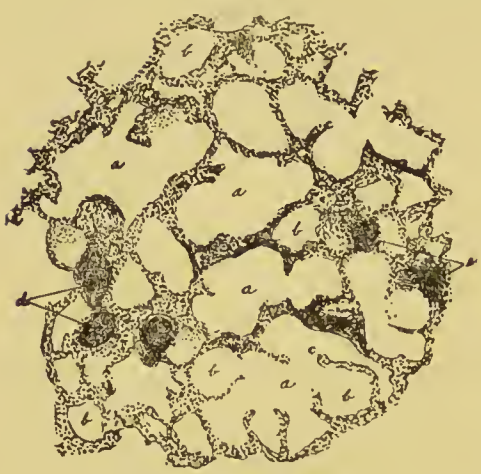


Fig. 9. Lung Tissues.

a. Air passages; *b.* Air cells; *c.* Cellular partition; *d.* Small blood-vessels; *e.* Carbon deposits.

Vital Capacity.

The capacity of the lungs is often a fair index of their physical condition. This is easily measured by a simple instrument, the spirometer. (See Fig. 11).

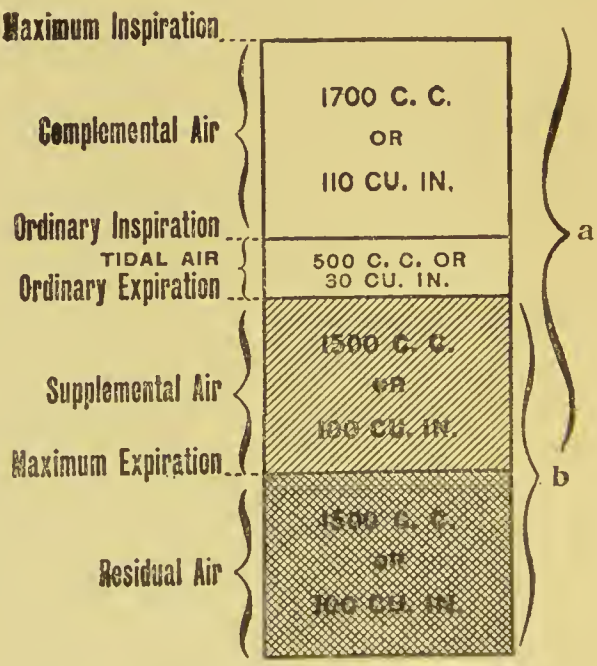


Fig. 10. Diagram showing volume of air respired.

a. Vital capacity; *b.* Stationary air.

After inhaling as much air as possible, breathe it out through the tube, which is held in the mouth. The amount is registered on a measured scale. This is the vital capacity. It should be at least 200 cubic inches in the average person. Less would probably indicate a weak chest or even lung disease. A larger amount means larger and, usually, stronger respiratory organs.

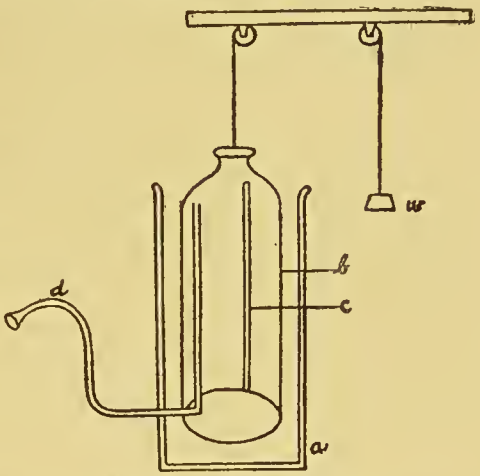


Fig. 11. The Spirometer.

a. Vessel filled with water; *b.* Cylinder with scale *c.*; *d.* Breathing tube; *w.* Counterpoising weight on pulleys.

The vital capacity may be increased by breathing exercises, full directions for which are given in Chapter II.—Physical Development.

Directions for Breathing.

Always breathe through the nose. The mouth is not intended for breathing purposes. The air when inhaled through the nose is properly filtered, warmed, and moistened.

Avoid constricting the waist by the use of stays, belts, or tight bands of any kind. Such practices are relics of barbarism, and indicate ignorance of the body and the laws of health. The lungs should always have perfect freedom, otherwise they will be hampered and the entire body will suffer in consequence. It is an excellent habit to practise deep breathing for five or ten minutes twice a day. By this means the lungs are thoroughly aired, and the blood is purified as well. Deep breathing,

taking pure, fresh air, of course, is a panacea for weak lungs and incipient tubereulosis. It is one of the best forms of exereise, and has the great advantage that no apparatus is required, and it can be practised anywhere except in a close, stuffy room.

Oxygenation of the Blood.

We have already hinted that the real purpose of breathing is to purify the blood. When the air enters the lungs it comes into close proximity with the blood, which is circulating in thousands of tiny vessels ealled capillaries. Here a very important interehange takes place. The oxygen from the air passes into the blood, to be carried to the tissues of the body, while earbonie acid gas leaves the blood and is expired with the air. This process, by which the blood is supplied with oxygen, is ealled oxygenation of the blood. It ehanges the colour of the blood from a dark purple to a scarlet red. The purified blood returns to the heart to be pumped to all parts of the body, where it distributes the oxygen to the hungry cells, and gathers up carbonic acid gas and other impurities. When it returns to the heart again it is in an impure state and has lost its bright red colour. Now the heart pumps the blood to the lungs to become oxygenated again, and so the wonderful process of aeration goes on night and day as long as life lasts.

Pure Air Necessary.

It is obvious from the foregoing remarks that only pure air should be breathed. Ventilation, or the supplying of fresh air to our homes, is of the greatest importance. The outside air is the purest, and there should always be provided an ample inlet for the fresh air as well as

an outlet for the foul air. The ordinary fire-grate is a good ventilator while the fire is burning. It affords an exit for the used air. An open window may give entrance to the fresh air, or, if this is too draughty, a simple device, known as Sheringham's valve, may be attached to the top of the window, as shown in Figure 12.

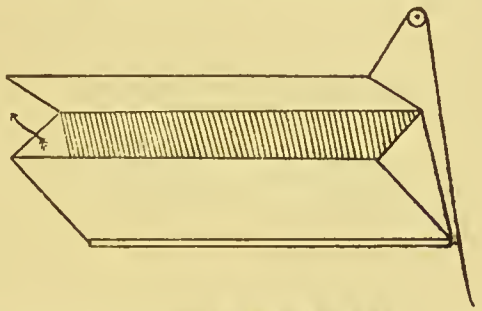


Fig. 12. Sheringham's Valve.

This may be fitted to a narrow opening at the top of a window. The amount of fresh air is regulated by raising and lowering the lid.

Another method, suggested by Keen, is shown in Fig. 13. A wide board is nailed across the lower sash, so that when it is raised two openings are provided, one above, which acts as an outlet, and another below, which lets in the pure air.

A still more simple arrangement, which would provide only one opening, however, could be easily secured by fitting a board, four to six inches in width, at the bottom of the window under the lower sash which would remain permanently raised, and thus provide a narrow slit-like opening between the two sashes through which the air could enter.

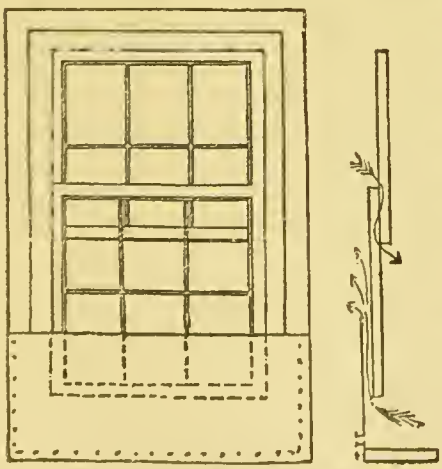


Fig. 13. Keen's arrangement.

We have mentioned all these devices in detail because of the great importance of fresh air. One or other device should be arranged if there is any difficulty in ventilating

the different rooms of the home. The expense and trouble involved would be very small and, compared with the advantage of obtaining fresh air, ought not to be considered.

The Voice-Box.

Before leaving the respiratory organs, we must mention the voice-box. The larynx, as it is also called, stands at the top of the wind-pipe, with which it is directly continuous. Externally it is marked by a prominence, just under the jaw, called Adam's apple. Inside the larynx is a pair of fibrous membranes, forming a slit-like opening between them. These are the true vocal cords, and their vibration produces sound. The air passing through the chamber sets the cords into vibration, and the pitch of their sound is regulated by the extent of their tension.



Fig. 14. Larynx, internal view.
a. Epiglottis.

Above and behind the larynx, a small opening, the glottis, leads into the mouth cavity. When drink or food is swallowed, this opening is closed by a door-like membrane, called the epiglottis, because it rests upon the glottis.

Drinking Water.

After the air, the most important food of the body is water. About seventy per cent. by weight of the body is water. The countless millions of cells in the body are constantly bathed by a watery fluid called lymph. The body requires a considerable amount of fluid, and water is the most wholesome drink for man and beast. Of course, a good proportion of the fluid is furnished by the food taken, especially by fruit and vegetables, the bulk of which consists of water. Nevertheless, it is a

good habit to drink water freely. It is best taken in the morning immediately after rising, also on retiring, and between the meals. One may drink from one to four pints daily, according to the character of the food and the condition of the body.

Contamination of Water.

Disease is often carried from one person to another through the water. This is especially true of typhoid fever. Consequently the water supply should always receive the most careful attention. If there is the slightest room for suspicion, boil the water before using it. Boiling destroys the germs, and renders the water safe to take if chemically pure. If this rule were regularly followed, much sickness and many untimely deaths would be prevented.

Pure water is the best and safest drink. Alcoholic beverages are poisonous, and should always be avoided. Most so-called temperance drinks are also best let alone. There is nothing that quenches the thirst better than pure, fresh water. Besides organic impurities, such as germs, water may contain poisonous salts of various kinds, but this is seldom true of water used for drinking purposes. Hard water contains mineral matter, and ought not to be used. Boiling will get rid of much of this undesirable matter and render it more wholesome.

The Natural Diet.

We now turn to the more solid foods which serve to nourish the body. There are three main varieties of food, not counting salts, namely: Proteid or Albumen, Starch and Sugar, and Fat.

Proteids or *albumens* contain nitrogen, carbon, hydrogen, and oxygen, and sometimes also iron, sulphur, or

phosphorus. On account of the nitrogen, they are often spoken of as nitrogenous foods. Proteid food is essential to the maintenance of life. Proteids are the true flesh formers. The white of an egg and the gluten of wheat are good examples of proteids.

Starch, in the process of digestion, is changed into sugar. Both contain carbon, hydrogen and oxygen, but no nitrogen. They are far more simple in composition than proteids, and are true energy producers. We might take rice or cornflour as an example of starch.

Fats are closely related to starches and sugars, and contain the same elements but in different proportion. They, too, are energy producers. Examples, dairy butter and olive oil.

A perfect diet should include all these various elements in proper proportions. The natural food of man is derived from the plant kingdom, and consists of fruit, cereals, nuts, and vegetables. These foods contain in abundance all the elements required for the sustenance of the body, and they are in the purest form obtainable. A more liberal diet includes dairy products.

The Cooking of Food.

Some people contend that it is unnecessary to cook food. This is true of most fruits and nuts, but it would be undesirable, if not impossible, for anyone to live for years exclusively on such a limited diet. Cereals and vegetables both require cooking. They contain raw starch which is indigestible. Cooking changes the raw starch into another form, sometimes called soluble starch, which is capable of digestion. Prolonged cooking makes grains and breads still more digestible by dextrinising the starch, that is, changing it into dextrine, an intermediate product between starch and sugar.

Salivary Digestion.

In studying digestion we will begin with the changes which the food undergoes, or at least ought to undergo, in the mouth. Here it meets a juice which is secreted by three pairs of salivary glands. The parotid is the largest of these, and is situated in front of and below the ear on either side. This is the gland that becomes so swollen and painful in mumps. The saliva contains a digestive ferment called *ptyalin.* This ferment attacks the starch and ultimately changes it into sugar. But such action is only possible when the ptyalin is brought into intimate contact with the particles of food. Hence the use of teeth and the importance of mastication.



Fig. 15. Human teeth.
Beginning at the left there are two incisors, one canine or eye-tooth, two bicuspids, and three molars.

An adult should have thirty-two teeth, sixteen in each jaw. The front teeth are for biting or cutting the food, and the back teeth for crushing or grinding it, thus assisting in the process of digestion. The more thoroughly the food is chewed, the more rapidly it is digested.

Saliva acts upon the starch alone, and has no effect upon proteids or fats. If food is well chewed, a smaller quantity will be required, and there will be less risk of over-eating.

The common use of sloppy foods doubtless leads to deterioration of the teeth and, in part at least, explains the frequency of their decay. Hard foods, such as twice-baked bread or zwieback, and well-baked whole-

meal or oatmeal biscuits, are useful in providing exercise for the teeth.

Gastric Digestion.

After the food has been reduced to a thin, creamy fluid, it is ready for swallowing, and, passing down the gullet, enters the stomach. The gullet or meat-pipe is a membranous tube or canal about nine inches in length. When empty it is collapsed. The stomach is a muscular bag with a capacity of two to four pints. There are three coats of muscle, one longitudinal, another transverse, and a third oblique. This peculiar disposition of the muscle enables the organ to contract upon the food from all directions, to grip and churn it, turning it about and mixing it with the stomach juice, and finally, to empty it into the intestine. This muscular action of the stomach is a very important part of its work. Anatomically considered, the stomach is merely a dilatation or widening of the alimentary canal. The food does not drop from the mouth to the stomach but is carried along a canal, the gullet, by a wave of circular constriction which travels down to the stomach. In the stomach it comes in contact with the gastric juice, which is secreted by numerous minute glands studding the lining of the mucous membrane. This juice contains a

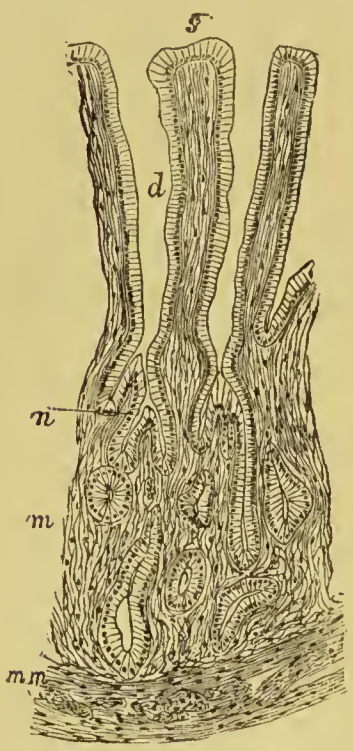


Fig. 16. Section through the mucous membrane of the stomach near the pylorus.

s. Free surface showing column-shaped cells; *d.* Duct of gland; *n.* Neck of gland; *m.* Section of small gland; *mm.* Thin muscle coat.

mineral acid and two digestive ferments. The hydrochloric acid has a destructive action upon germs that may have entered with the food, and also assists in the process of digestion.

Salivary digestion, or the change of starch into sugar by the saliva, continues in the stomach for about half an hour or until neutralised by the acid. At the same time the food is also undergoing gastric digestion. The juice of the stomach acts only upon proteids, changing them into peptones. This change is brought about by a ferment called *pepsin* which acts in the presence of the mineral acid. The change of proteids into peptones prepares them for absorption into the blood.

The other ferment in the stomach is known as *rennin*. It acts upon milk, curdling it.

The time required for stomach digestion depends upon the activity of the organ, the quality of the gastric juice, and the character of the food. Some varieties of food are very quickly digested while others require several hours. For an ordinary meal from three to four or possibly five hours would be necessary.

Intestinal Digestion.

After the food has been acted upon by the gastric juice it is called *chyme*. The chyme passes out of the stomach into the small intestines where it meets the bile and pancreatic juice. The latter is secreted by the pancreas or sweetbread, and contains three ferments, which attack all varieties of food. Of these three, *amylopsin* digests the starch and completes the work started by the saliva. *Trypsin* acts upon protcid, and carries on the work begun in the stomach. Still another ferment, *steapsin*, attacks the fat which, up

till now, has received no attention. With the assistance of the bile, the fat is emulsified and prepared for assimilation by the *lacteals*, small vessels containing a milk-like fluid, which are found in the intestinal walls. The glands of the intestines also secrete a ferment which is known as *invertin*. It acts upon cane sugar, changing it into grape sugar, which readily passes through the walls of the intestines and then enters the blood-stream. Like the fat, cane sugar has thus far had no attention from the various digestive juices.

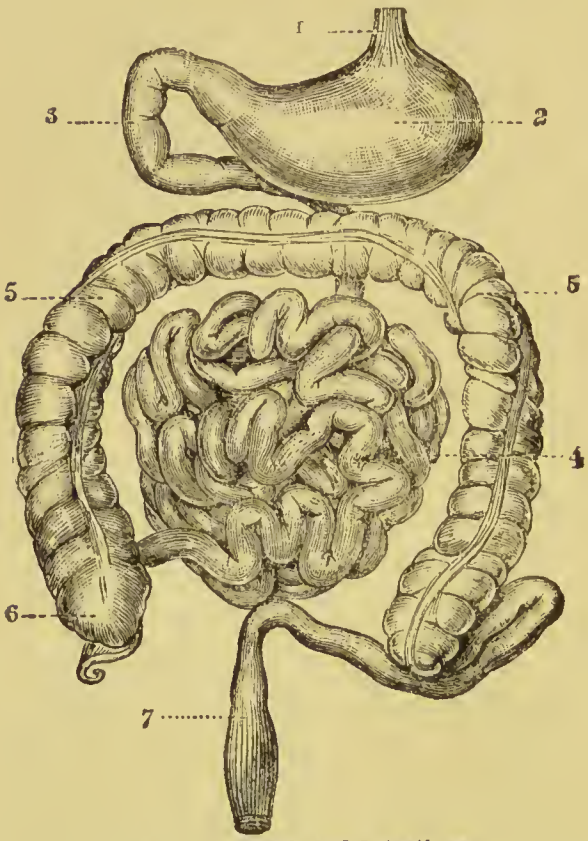


Fig. 17. Stomach and Intestines.

1. Œsophagus; 2. Stomach; 3. Duodenum; 4. Small intestine; 5. Large intestine; 6. Cæcum with vermiform appendix; 7. Rectum.

In the small intestine the various processes concerned with digestion are completed, and here is where most of the food is absorbed.

Assimilation.

Food in the stomach or intestines is really still outside the body. The sole object of digestion, as far as we understand it, is to render the food capable of

passing through the intestinal wall and blood-vessel into the blood-stream. This process is known as assimilation or absorption. Only a very small fraction of either food or water is absorbed from the stomach. The larger part passes into the intestines, from the walls of which it is taken into the blood of the numerous capillaries circulating in the mucous membrane of the intestines. Just how the process of assimilation takes place is not well known to us, other than that it is a vital process which somewhat resembles *osmosis*, a sort of filtration. Not all the food passes into the blood. Most of the fat finds its way into the numerous lacteal vessels which line the inner surface of the canal, and is finally carried by a special vessel to one of the large veins. The sugar and peptones, however, are received into the blood, and carried first to the liver for inspection.

The Liver as a Storehouse.

It would seem that the liver acts as a sort of inspector and storehouse for the body. It has the duty of withdrawing any surplus sugar in the blood and storing it up in its own substance in the form of liver starch. Another of its functions is to remove from the blood harmful bodies of various kinds which enter with the food. The "con-

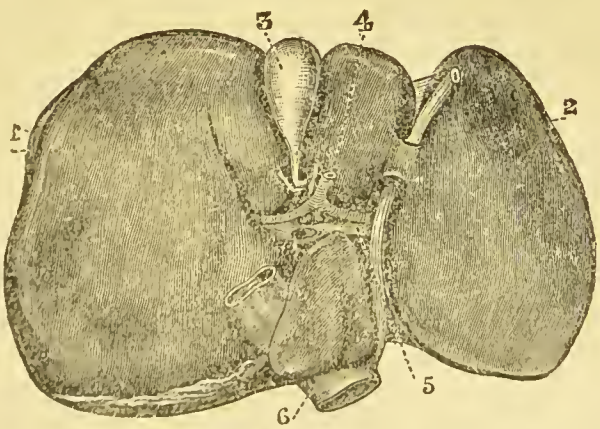


Fig. 18. Liver, showing under surface.

1. Right lobe; 2. Left lobe; 3. Gall bladder; 4. Hepatic artery; 5. Portal vein; 6. Vena cava.

traband," whatever it is, becomes stored in the liver to be neutralised or eliminated later.

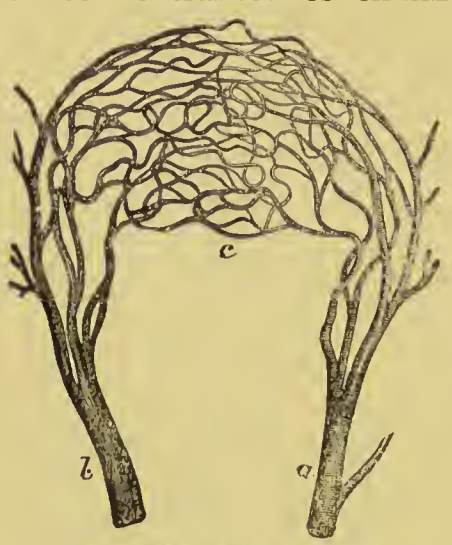


Fig. 19. Artery and vein with joining capillaries.
a. Artery; *b.* Veins; *c.* Capillaries.

The Rôle of Bile.

One of the most important functions of the liver is to make bile. This is a very bitter, brownish, semi-fluid substance, which assists in the digestion and assimilation of food. It is also a mild laxative, and helps to regulate the bowels. Further, the bile is to a certain extent an excretion, carrying impurities of various kinds out of the system.

Bile is a very irritating substance, and when, through some disorder of digestion, it gains admission into the stomach, it is likely to cause vomiting with a good deal of retching.

The Circulation of the Blood.

We have traced the air, water, and food to the blood, and now we come to consider their distribution throughout the body.

The blood circulates in a system of closed tubes called blood-vessels. These consist of arteries, veins, and capillaries, the latter being microscopic in

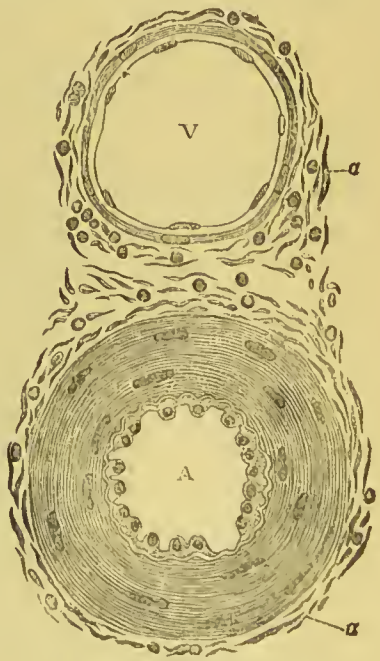


Fig. 20. Transverse section of artery and vein.
A. Artery; *V.* Vein; *a.* fibrous coat.

size. By means of these vessels, which are very numerous, the blood reaches all parts of the body, and supplies the tissues with food material. The blood is always moving, and the rate of flow is very considerable. In the large arteries that go to the head it is estimated that the blood flows at the rate of sixteen inches each second. The flow in the large veins is four inches per second. In the small capillaries it is slowest, only two inches in one minute. But we must remember that the capillaries are very short vessels, and the time required to pass through them would only be a small fraction of a minute. About a third of a minute is required for a complete circuit of the blood from the heart and back to that organ.

The Heart.

What makes the blood circulate? To solve this problem we must look to the heart, which we shall find is a simple muscular force-pump. The heart lies in the chest behind the breast bone and between the second and sixth ribs. About two-thirds of the organ lies on the left, and only one-third on the right side of the middle line. It contains four chambers, two above called auricles, which receive the blood from the veins, and two below known as the ventricles, which, contracting, drive the blood through the arteries away from the heart. The openings between the upper and lower chambers of the heart are supplied with

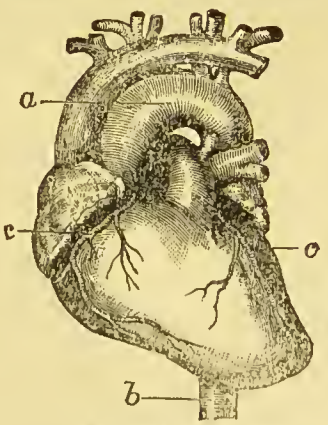


Fig. 21. The heart and large blood-vessels.

a. Arch of aorta; *b.* Aorta; *c.* Coronary arteries.

strong membranous valves which prevent the flow of the blood backward. Similar valves are found at the root of each artery leaving the heart. They are closed by the pressure of the blood at the end of the muscular contraction, and prevent the blood from flowing back into the heart.

The Systemic Circulation.

When the blood is expelled from the left ventricle of the heart it enters the aorta, the largest blood-vessel of the body. This vessel branches, and the branches keep branching until the blood reaches the fine, delicate capillaries which are found everywhere in the body. From the smallest vessels it is gathered up by the veins, and finally carried back to the right upper chamber of the heart. This is the systemic circulation, so-called because it supplies every organ and tissue of the entire bodily system.

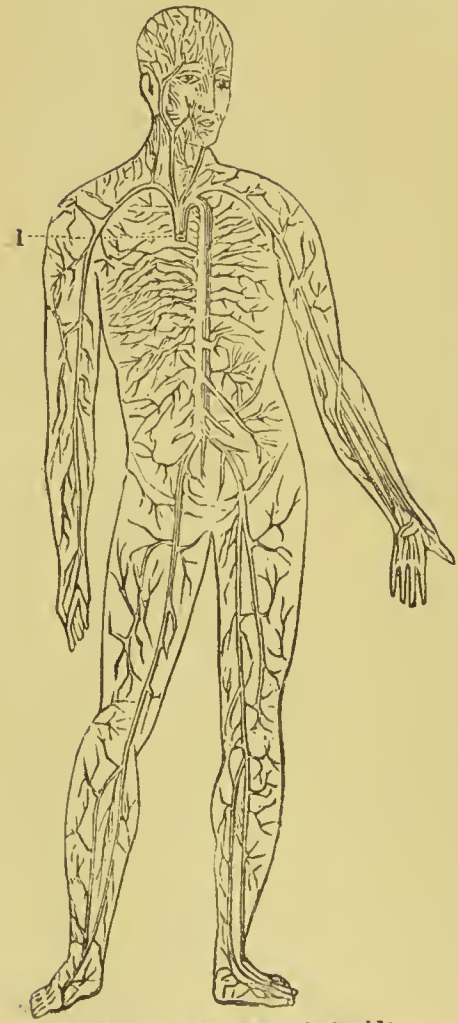


Fig. 22. Figure showing wide distribution of blood-vessels.
1. Beginning of aorta.

The blood is again pumped from the heart, this time by the right ventricle, and carried to the lungs by the pulmonary artery for a supply of oxygen, after which it returns

to the left side of the heart to be again pumped into the aorta. This is the pulmonary circulation.

Composition of the Blood.

As one would naturally expect, the blood is a very complex fluid. It contains in brief two kinds of material, besides cellular bodies and water, namely, nutriment and waste. The nutriment is derived from the food eaten, and the waste is gathered up from the tissues. The expenditure of energy in any form produces waste substances which are of no further use to the body. Consequently they are taken up by the blood-stream and carried to the excretory organs, such as the kidneys, skin, and lungs, by which they are passed out of the body. The elimination of tissue wastes is very essential to health. Should the waste material be retained, it would clog the vessels, irritate the tissues, interfere with the functions of the organs, and make for disease and death.

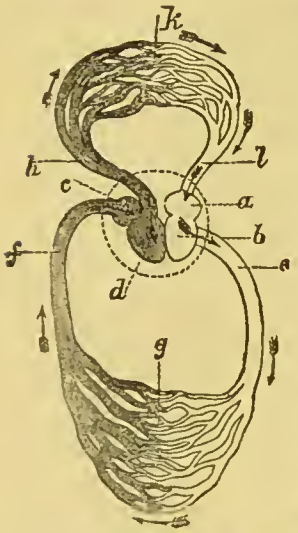


Fig. 23. Diagram showing circulation of the blood.

The arterial blood is indicated by the white, and the venons by the shaded portion. *a*. Left auricle; *b*. Left ventricle; *c*. Right auricle; *d*. Right ventricle; *e*. Aorta; *f*. Vena Cava; *g*. Systemic circulation; *h*. Pulmonary artery; *l*. Pulmonary vein; *k*. Pulmonary circulation.

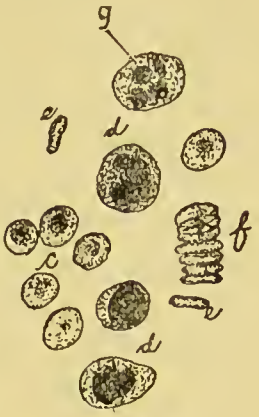


Fig. 24. Human blood-cells.

c. Red cells; *d*. White cells; *e*. Red cell on edge; *f*. "Coinpile" of red cells; *g*. Nuclei of white cell.

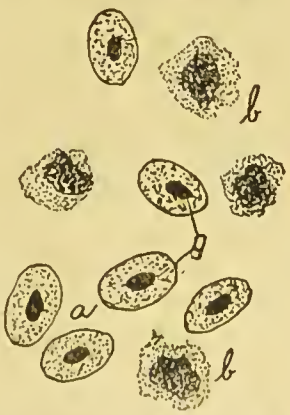


Fig. 25. Frog's blood-cells.

a. Red cells; *b*. White cells; *g*. Nuclei of red cells.

Oxygen Carriers.

The blood eontains a large number of small bodies called eells. Some are white, but most have a yellowish colour, and are called red eells. These red eells carry the oxygen from the lungs to the tissues of the body. There are 5,000,000 red eells to every eubie millimetre of blood, a small fraetion of a drop, or about twenty-four thousand million in the body. These cells are eurious little rounded dises with bi-coneave surfaees. Laid side by side it would take 3,200 of them to make one inch, and piled up one on the other, four times as many would be required. Taken singly they are of a light yellow colour, and their strueture is exceedingly delieate, eonsisting of a very fine fibrous mesh or network. This mesh holds a nitrogenous eolouring matter known as *hæmoglobin*, whieh has a peeuliar affinity for oxygen, and eonstitutes the essential part of the red blood-eell.

Soldiers of the Body.

The white eells are somewhat larger than the red but mueh fewer in number. They number about ten thousand to every 5,000,000 of the red cells. Their speeial duty is to defend the body against mi-erobes. It is believed that they destroy the germs that may gain admittance to the blood, and thus act as proteetors of the body. If there is a bruise or abrasion of the skin anywhere, the white eells gather in large numbers at the injured



Fig. 26. Human white blood-cell showing various phases of amœboid movement.

spot, and doubtless help to prevent the invasion of germs, and also assist in bringing about healing. The white cells are irregular in shape and possess amœboid movement; that is, they can travel about in the tissues, although very slowly.

Quantity and Colour of the Blood.

The quantity of blood in the body is about one-thirteenth of the total body weight. In other words, a person weighing 130 pounds would have about ten pounds of blood. About one-quarter of the blood is found in the liver; another quarter in the muscles; still another in the heart and large vessels; and the remaining fourth is distributed throughout the rest of the body

The blood has an intense red colour, and it requires but a few drops to give a distinctly red tinge to a large quantity of water. Consequently people are often easily deceived as to the amount of blood lost at any time, and usually overestimate the hæmorrhage.

The blood has a peculiar saltish taste, and a characteristic odour.

Clotting of Blood.

It is well known that soon after the blood is shed it changes into a solid mass called a clot. This solidification is due to the presence of a particular ferment and certain salts, and is of the greatest significance possible from a physiological standpoint. Were it not for the clotting process, bleeding would never cease, and even a small wound would prove fatal. But as soon as blood comes in contact with air or foreign bodies, it begins to thicken, and this, of course, retards the flow, and soon puts a stop to it entirely.

The clot first takes the form of a soft jelly. Then it begins to contract, and a straw-coloured fluid exudes from it, leaving a small hard mass.

Metabolism or Tissue Activity.

After thus briefly discussing both digestion and assimilation, and also the circulation of the blood, let us turn to the various processes which take place in the different tissues and organs of the body. All the tissues are undergoing changes of various kinds each day. Minute blood capillaries circulate among the tissue cells everywhere, carrying food material for their sustenance and removing the waste matter which results from their activity. Without this activity, death would soon intervene. Each cell has its particular duty to perform. The cells of the stomach make gastric juice, while those of the liver manufacture bile, which is quite a different fluid. The long fibrous cells of the muscles contract, and thus do work of various kinds — lift a weight or make some other movement of the arms, or legs, or trunk. The cells of the brain do our thinking, while the nerves carry messages. To accomplish all this work energy is constantly being expended, and the tissue cells become worn and enfeebled. In order that the functions of the various organs may not be interfered with this wear must be made good promptly, and the tissues built up again. Metabolism includes both the building up and breaking down process, and is an expression indicating activity of the tissues.



Fig. 27. Capillary vessels and tissue cells.

Production of Heat.

The different parts of the body are maintained at a remarkably equable temperature. In health the average temperature, when taken in the mouth, is about 98.6 degrees Fahr. A reading of a few more degrees means fever, and the seemingly small rise of only ten degrees is usually accompanied by fatal results. A few degrees below normal would indicate a very serious state of things, and might also be accompanied by a cessation of life.

Animal heat is derived from the food eaten. Most of the food serves as fuel to the body and undergoes combustion, thus producing heat. To make combustion possible, oxygen is required; hence the importance of fresh air and proper breathing.

The internal fires produce natural heat which keeps the healthy body in a state of proper warmth. These fires are stirred by exercise, which makes them burn brighter (to use an apt comparison) and produce more heat.

Distribution of Heat.

Here again the blood plays an important part, and serves to equalise the temperature in different parts of the body. But the nerves control the distribution by influencing the size of the vessels. It was once thought that all the heat of the body was produced by combustion processes taking place in the blood, but now we know that combustion goes on everywhere in the body. However, the blood does act as a distributer of heat, and by this means a uniform temperature of the various parts of the body is maintained. Naturally the blood circulating in the skin is more or less quickly cooled,

and thus a large proportion of the heat produced is constantly being dissipated. This loss of heat must be met by the production of more heat.

The Source of Energy.

The food not only repairs the body but is the source of all energy which is available for the performance of work. Any manual labour, whether it be walking, digging in the garden, cycling, cutting wood, or climbing a tree, means the expenditure of energy, all of which is derived from the food we eat. Only a fraction of the energy produced daily in the body is available for manual labour. Most of it takes the form of heat and serves to maintain the temperature of the body. Nevertheless, from the standpoint of mechanics, the body is the most perfect machine known, yielding a remarkably large percentage of work in proportion to the heat given off.

Growth and Development.

Thus far we have seen that the food eaten is used in supplying energy and heat to the body, and in making repairs. It has still another function to perform, and that is to produce growth and development during the years of childhood and youth. We may roughly divide human existence into three stages: (1) The stage of growth — from birth to the age of about thirty; (2) The stage of adult life, when there is neither growth nor decline — from the thirtieth to the sixtieth year; (3) The stage of decline — from the sixtieth to the ninetieth year and beyond.

During the first period of life a considerable amount of food is required for building the body, and making bone, muscle, and other tissues.

The period of adult life should be one of the *status quo*, that is, a standstill, as far as physical growth or decline is concerned. Repair goes on to make good the wear and tear of ordinary life, or injuries due to accident or other causes.

Decline begins at about sixty or soon after. The organs and tissues begin to undergo a shrinkage, very slow and almost imperceptible at first, but more pronounced in later years. There is an appreciable decrease in height, strength gradually diminishes, and an increasing feebleness comes over the body.

The Wastes of the Body.

We have spoken of the food and its use in the body, and we have hinted at the wastes that result. The body is constantly changing. It is not the same to-day as yesterday, and it will be again different to-morrow. In the course of a few months there is a more or less complete change, practically all the elements being removed, and new ones taking their places. So we find that waste matter is being thrown out of the body daily. It is very important that these substances should be got rid of as soon as formed, because, one and all, they are detrimental to living tissue, and soon clog the system with impurities. The wastes are produced in all parts of the body. But the most active organs naturally form the largest quantity of waste matter.

Excretory Organs.

To eliminate these poisonous substances the body is provided with a number of excretory organs whose special duty is to select waste and useless matter from the blood and throw it out of the system. We have already explained that the blood-stream, circulating, as

it does, everywhere in the body, receives the wastes and carries them to the excretory organs. Thus it has a double duty to perform, first, to bring food to the organs, and, second, to remove the waste matter.

The three chief excretory organs are the lungs, kidneys, and the skin.

The Lungs as an Excretory Organ.

It has already been explained that the lungs purify the blood by furnishing it with oxygen, and relieving it of its carbonic acid gas and certain organic waste matters. The elimination of the poisons is quite as important as the supply of oxygen, for if they were allowed to remain in the body even for the space of a few minutes they would produce fatal results. The breath which is exhaled from the lungs is always laden with waste matter, and contaminates the air. In a room it soon causes a foul odour, which is very characteristic, and this at once indicates that the air is unfit to breathe.

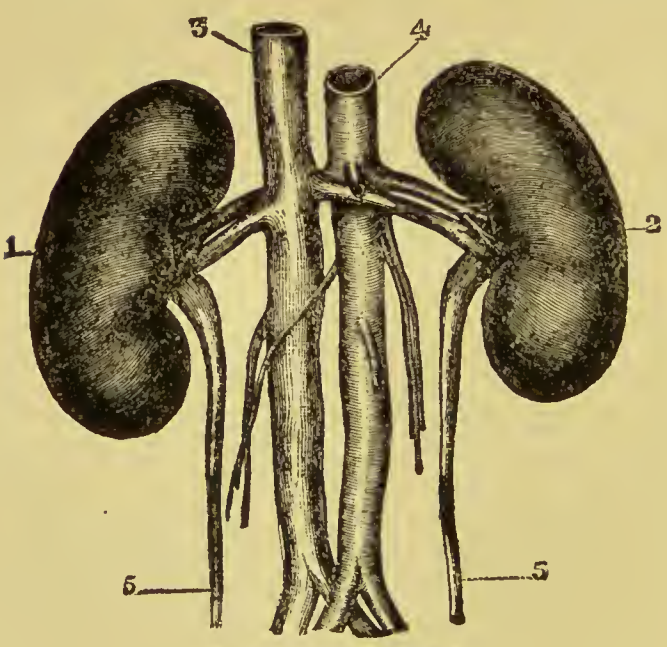


Fig. 28. Human kidneys.

1. Right kidney; 2. Left kidney; 3. Vena cava; 4. Aorta; 5. Ureters (vessels connecting kidneys with bladder).

The Kidneys.

The sole function of the kidneys is to excrete urea, uric acid, and other useless substances. The waste bodies are brought to the kidneys in the blood. Each kidney is a mass of glandular tissue bound together by a fibrous network. The glands, of which there are a large number in each kidney, are lined with cells which have the power of selecting certain waste substances from the blood. They also take water from the blood, and the material thus removed becomes the kidney excretion or urine. The kidneys are at work all the time, day and night. As the excretion is formed, it is stored in a sac, called the bladder, from which it is expelled from time to time as required. If the kidneys should become diseased and go "on strike," the consequences would be rapidly fatal. Death produced in this way is said to be caused by uræmic poisoning.

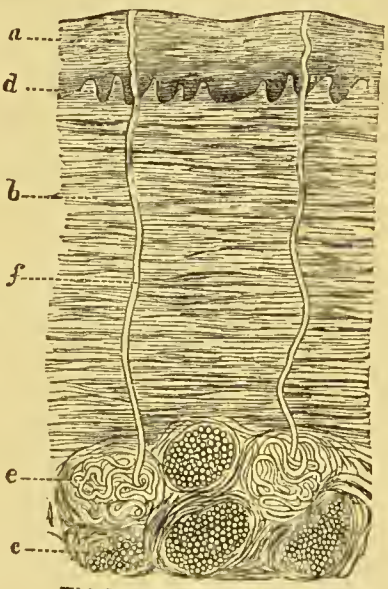


Fig. 29. Vertical section through human skin.

a. Epidermis or false skin; *b*. True skin; *c*. Fatty tissue; *d*. Papillæ *e*. Sweat glands; *f*. Sweat duct.

The Skin.

This is another important excretory organ. It consists of two distinct coats, an outer *epidermis* or false skin, and a deeper *cutis vera* or true skin. The outer coat is also called the scarf skin, and consists of numerous layers of more or less flattened *epithelial* cells. The superficial cells are mere thin scales which are constantly peeling off. The true skin is made up of tough fibrous tissue,

which, unlike the scarf-skin, is well supplied with nerves and blood-vessels. It also contains several million small pockets, known as the sweat or perspiratory glands. All these glands have a rich supply of blood-vessels, and from the blood brought to them they select waste matter and throw it out upon the surface of the skin. Scattered among the sweat glands are a number of oil glands, which lubricate the skin and hair, and thus keep it in a supple, healthy state. The skin area of an average adult amounts to about 2,500 square inches.

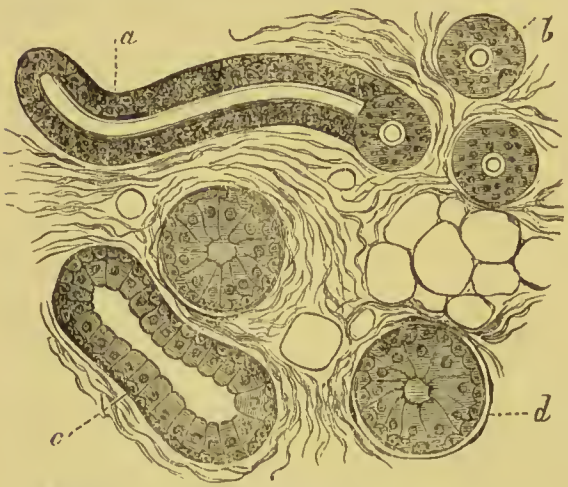


Fig. 30. Section of the human skin showing sweat glands cut in different directions.

Duct cut in (*a*) longitudinal and (*b*) transverse section. Glandular portion cut in (*c*) longitudinal and (*d*) transverse section.

The skin perspires all the time, but only when we get very warm or take vigorous exercise does the sweat become perceptible. Otherwise it is called "insensible perspiration." There is a reciprocal relation between the skin and the kidneys. In hot weather when the skin perspires freely, the quantity of urine is diminished, and it becomes more highly coloured. On the other hand, the skin is comparatively inactive on a cold day, and the kidneys excrete a larger amount of urine of a pale colour.

The Liver as an Excretory Organ.

As previously intimated, the liver may also be regarded as an eliminative organ. The bile is the product of the liver, and it contains excretory matter, which is carried

to the intestines to be expelled from the body. This function of the liver, while scarcely a preponderating one, is of considerable importance to the well-being of the body, and cannot be neglected

The intestines, too, must be looked upon as an excretory organ, as they carry considerable useless material out of the system.

The Significance of Uric Acid.

Since the important researches of Dr. Haig and others, uric acid has attained a new and very important significance. Under normal and healthy conditions it would appear that comparatively little uric acid is formed in the body. This acid is derived from the nitrogenous foods eaten, and especially animal flesh, stale eggs, legumes, and mushrooms. Tea and coffee contain a considerable quantity of a similar substance, and are consequently very undesirable drinks. Under proper conditions, where the diet is wholesomo and exercise is not neglected, the nitrogenous foods taken (proteids or albumens) are ultimately changed into *urea*, and in this form eliminated from the body.

But if too large a quantity of albumen is eaton, or if exercise is neglected, and the person leads a sedentary life, the metabolic processes in the body are likely to be incomplete, and as a result uric acid is formed. It is, furthermore, a well-known fact that flesh always contains uric acid. Thus by eating flesh the tissue wastes of tho cow or pig, as the case may be, are introduced into the human body. It is surely unnecessary to say that such a double burden of waste must, and undoubtedly does, havo a pernicious effect upon both the digestive and excretory organs by overtaxing them, and also upon the body gener-

ally. The latter gradually becomes saturated with uric acid, which gathers in the joints and ligaments as well as other tissues, producing rheumatism, gout, neuralgia, headache, backache, and many other aches and pains.

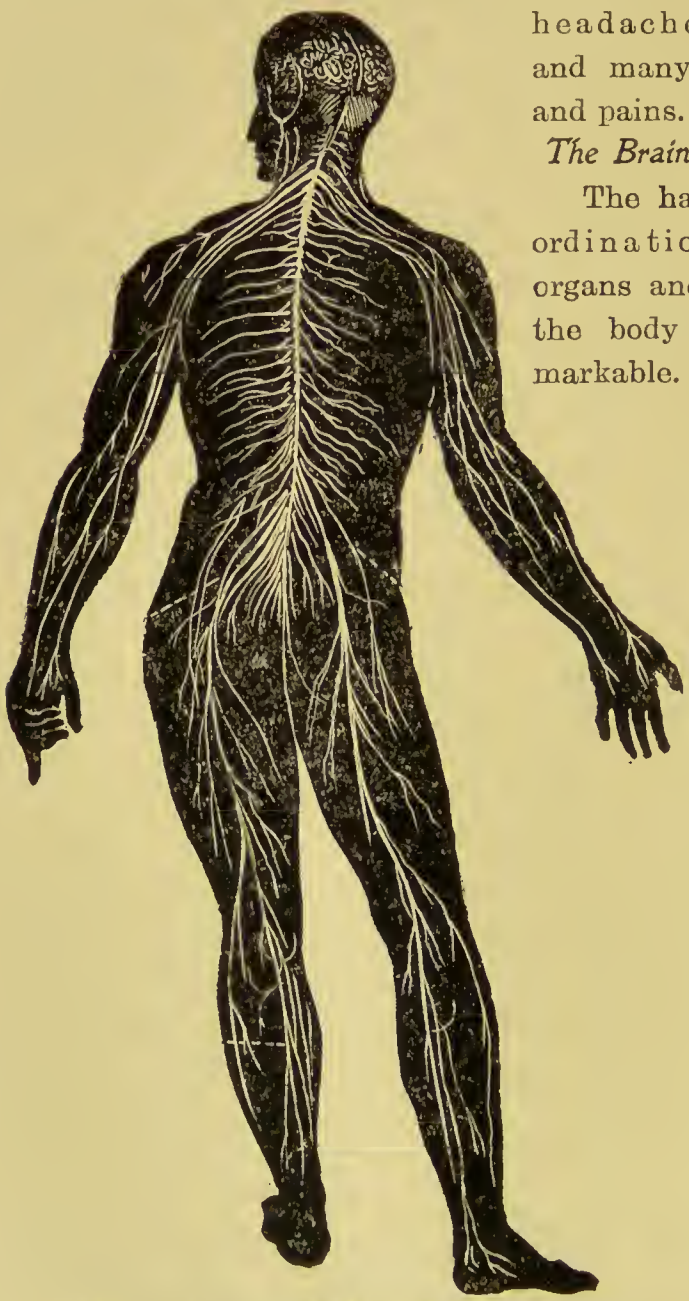


Fig. 31. Figure of a man showing nervous system.

The Brain and Nerves.

The harmonious coordination of all the organs and tissues of the body is very remarkable. This harmony, perfect in a state of health, is secured through the influence of the brain, which by means of nerves is connected with all parts of the body.

The nervous system is the most complex and highly developed in

the body. The brain is the centre of this system, and the seat of the mind. Directly or indirectly it manages all the other organs, and brings them into harmony with one another. The brain coordinates the muscles so that they act in unison, and a man can walk or run with scarcely a thought concerning his equilibrium. The brain regulates the strength and rate of the heart beat, and manages the breathing of the lungs. It also directs the work of the stomach, the kidneys, and all other organs, and secures their harmonious action.

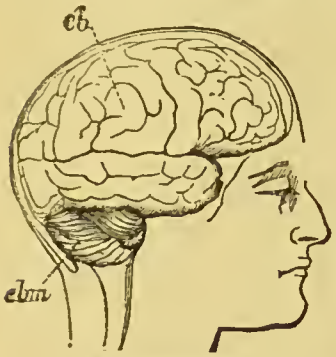


Fig. 32. Brain.

cb. Cerebrum or large brain; *cbm.* Cerebellum or small brain.

The Structure of the Brain.

By means of a microscope it is possible to study the structure of the brain. When we examine it carefully, we find that it is made up of countless millions of minute bodies called brain cells. These are of various forms. Some are pear-shaped, with numerous branches; others are spindle-shaped; and still others have the appearance

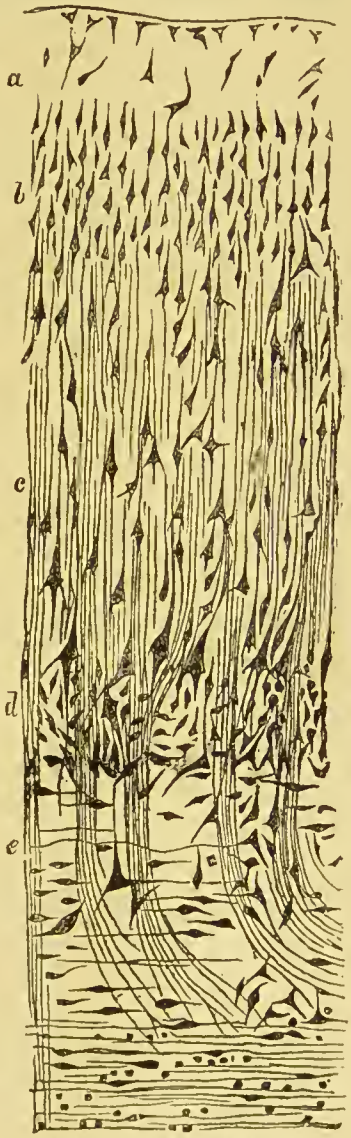


Fig. 33. Gray matter of brain much enlarged.

a. Superficial layer of cells; *b.* Small pyramidal cells; *c.* Large pyramidal cells; *d.* Granular layer; *e.* Spindle-shaped cells.

of tiny pyramids or stars. They also vary greatly in size. Most have a very faint yellowish colour, which is due to the presence of a special pigment.



Fig 34. Brain cell (pyramidal) showing numerous branches. (Greatly magnified.)

All brain cells and, for that matter, all nerve cells, have at least one branch or process, and most of them have several. The branches carry nerve impulses or messages which originate in the cells.

If the finger is burned, the fact is promptly telegraphed to the brain by the nerve cells of the skin, and we feel at once a sharp pain which we recognise as being associated with the finger.

The Nerves and Their Functions.

All the nerves are connected with nerve cells of one kind or another. Indeed, the nerve fibre is in reality a fine, delicate extension of the nerve cell, and acts as a carrier of messages from one part of the body to another part.

All nerve fibres possess a special property known as *conductivity*, for it is their peculiar function to transmit impulses or conduct sensations of various kinds.



Fig. 35. Nerve cells from posterior root ganglion.

The nerve fibres are gathered in bundles which form nerves, and are distributed to the body. There are two varieties of nerves, *motor* and *sensory*. The motor nerves are connected with the voluntary muscles, and bring about a contraction at the command of the will. Sensory nerves carry sensations of pain, touch, heat, cold, etc. These nerves are distributed chiefly in the skin and its appendages.



Fig. 36. Nerve cells from spinal cord.
*c*1. Large stellate cell; *c*2. Small cell.

The Mission of Pain.

Pain is a danger signal. It must be looked upon as the red flag of warning. Pain tells us that something is wrong. We should promptly seek the cause of the pain and attempt to remove it. The usual custom of annihilating pain by some powerful drug or anodyne is a sad mistake and a most unnatural practice. Such drugs undoubtedly bring relief, but only by paralysing the nerves so that they are unable for a time to carry sensations of any sort. The relief, too, is only temporary, and the last case of the person is often worse than the first. Far wiser is it, by putting away bad habits, where necessary, to remove the cause of the pain and begin to cultivate health in earnest by adopting a simple hygienic life.



Fig. 37. Nerve fibres.

The Special Senses.

There are five special senses—hearing, sight, taste, smell, and touch. We will consider the last first. The sense of touch is located in the skin. Here are found certain nerve organs called *touch corpuscles.* They are linked to the brain by nerve fibres. When we handle a ball or a marble, we recognise its shape, size, and degree of hardness. This is exercising the sense of touch. In the tips of the fingers it is much more delicate than on the back of the hand and most other parts of the body.



Fig. 38. A touch corpuscle from the skin of the hand.

The organ of smell is in the lining membrane of the nose, and this is called the olfactory region. Here are found curious, small, nerve cells which are very sensitive to odours. To distinguish an odour, we hold it to the nose and sniff at it. An unpleasant odour usually indicates something unwholesome, and bids us avoid it.



Fig. 39. Tongue showing papillæ.

The Sense of Taste.

The nerve endings which have to do with the perception of taste are located on the back part of the tongue. There is a very close relationship existing between taste and smell, and we not infrequently confuse one sense with the other. The sense of taste is given us to discriminate between that which is good and that which is bad. If all people had a perfectly natural taste, only pure and wholesome

food would be acceptable. But, unfortunately, most of us have a perverted appetite and through careless indulgence have come to like that which is not good. For example, to take a rather extreme case, some people are fond of decaying cheese. This is certainly a perverted craving, and of course such a taste should not be gratified. Others, again, and this is a very common perversion of taste, like the flavour of alcohol and crave strong drink. It would seem ridiculous that four square inches or less of a perverted tongue surface should dictate the food and drink of a person, but such is too often the case. The indulgence of an unnatural appetite is frequently the chief cause of dyspepsia, impoverished blood, and general malnutrition, all of which pave the way for disease.

The Organ of Hearing.

This is situated in the substance of one of the hardest bones in the body. The nerves which have to do with hearing are distributed to a complex bony labyrinth which is situated in what is known as the inner ear. The external appendage has little to do with hearing, although it is believed to assist in gathering up *sound waves* and concentrating them in the internal ear.

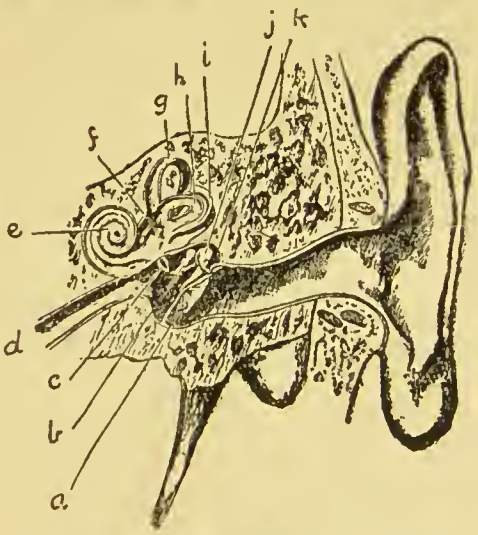


Fig. 40. Ear.

a. Tympanic membrane; *b*. Incus; *c*. Stapes; *d*. Eustachian tube; *e*. Cochlea; *f*. Vestibule; *g*. Superior semi-circular canal; *h*. Posterior semi-circular canal; *i*. External semi-circular canal; *j*. Malleus; *k*. Attio of tympanum.

The opening in the ear is called the *external auditory meatus*, and is a wind-

ing, irregular passage which leads to the drum. The latter is a thin, delicate membrane of fibrous tissue, which completely walls in the middle chamber of the ear, separating it from the outer canal. The middle chamber is primarily an air receptacle, and is normally in communication with the air by means of a slender canal, the *Eustaehian* tube, which leads to the upper part of the mouth cavity behind the nostrils. This portion of the ear contains three curious little bones, called *auditory ossieles.* They are so arranged that they transmit the vibrations of the drum to the labyrinth.

The Labyrinth.

This appears to be the essential structure concerned in the process of hearing. Distributed throughout the length of the labyrinth, part of which resembles a snail shell, is found a rich supply of nerves and nerve cells, and it is believed that these have to do with the recognition of sound.

But if the auditory nerve were cut in any part of its course to the centre of hearing in the brain, the sensation of hearing would be lost.

Deafness.

Deafness is due in a large number of cases to chronic catarrh of the ear which has long been neglected. It is needless to say, that such catarrh keeps the victim on the edge of a precipice, so to speak. At any time a cold may aggravate the condition, and give rise to more serious symptoms.

Perhaps in most cases the catarrh of the ear is secondary, having its origin in the throat and travelling up through the open Eustachian tubes.

Accumulation of Ear Wax.

The ear secretes a yellowish, oily, wax-like substance which acts as a lubricant and serves for protection. If this gathers in too large a quantity it may stop the external canal of the ear entirely, and interfere with hearing. To hear well, the drum must always be free and accessible to the air. Otherwise the hearing is perceptibly dulled, and there are often peculiar noises in the ear, such as ringing or singing.

To relieve the deafness, run in a few drops of sweet oil and plug gently with a bit of cotton wool, letting it remain for some hours or overnight. Then syringe the ear gently with warm water, and the wax will come out. The treatment may have to be repeated. If possible, it is best to have a physician or a qualified nurse to attend to this matter.

Never strike the ears of a child under any circumstances. It is a very vulgar punishment, to put it mildly, and may cause lasting injury and even deafness. There are other punishments which are more effectual and less barbarous.

The Eye and Its Structure.

The eyes are most wonderful organs, serving as lights of the body. Their structure is very complicated, but a brief description may be interesting.

The eye is a globular body with three coats. The outer coat or layer is composed of tough, fibrous tissue and serves as a protective membrane. Next comes a layer of tissue which is very rich in blood-vessels. This is the nutritive or vascular coat. Lastly and innermost is the nervous coat, or the essential part of the eye. It consists of several layers of nerve cells and nerve fibres.

Here the rays of light come in contact with nerve matter and so affect it that certain sensations are carried to the brain, producing an image in the mind corresponding to the object looked at.

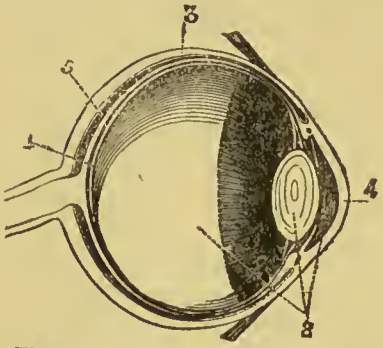


Fig. 41. Section of eye showing optic nerve at the left.

1. Retina; 2. Transparent refracting media (vitreous humour, lens, and aqueous humour); 3. Fibrous coat (sclerotic); 4. Cornea; 5. Choroidal membrane.

On entering the eye, the rays of light pass through a body called a lens, which bends the parallel rays and causes them to meet at the back on the nerve layers. This innermost layer is called the *retina*. The convexity of the lens is regulated by the ciliary muscle, and under normal conditions the eye can easily adjust itself for both near and distant objects.

Common Defects of the Eye.

There are certain defects of the eye which, because they are so common and important, ought to receive at least passing attention. The eyeball may be flattened in the anterior posterior diameter, so that the image is focussed behind the retina. Such a condition is the most common defect of the eye, and, if only slight, may not cause much inconvenience. If considerable, however, it will lead to strain of the organ and produce eyeache and frontal headaches. Consequently it should receive careful attention.

The treatment for *hyperopia*, as the defect is called, is to provide glasses with convex lenses to relieve the increased work of the ciliary muscle. The symptoms are characteristic, and consist of the eyeache or headache already mentioned, blurring of the letters when reading,

imperfect or indistinct vision, especially of near objects, watering of the eyes, and sometimes a feeling of sickness. When these or similar symptoms are present, the patient should always consult an eye specialist.

Less often the eyeball is elongated and the image focussed in front of the retina. The symptoms of indistinct vision are somewhat similar to those already mentioned, except that distant vision is particularly bad. To correct the difficulty, concave glasses will be required, so that the rays of light will be diverged until they fall on the retina.

Sight in Old Age.

As age advances, it is usually necessary to provide glasses for reading and all fine work. This change is due to loss of elasticity of the lens and eye muscle, and is made good by glasses similar to those required for *hyperopia.* As a rule they are needed only for near vision.

There are many other defects of the eyes, but these are perhaps the most common. Sometimes a child is cross-eyed, and the result is very unsightly. It is usually due to the weakness of the eye muscles, and can be corrected by a surgical operation. The more powerful muscle may be cut, which permits the eye to be brought into its normal position. This operation ought to be performed as early in life as possible, for then it is most successful.

CHAPTER II.

Physical Development.

IT was a saying of Herbert Spencer that the first essential to success in life is "a good animal." Certainly the man who is blessed with firm, elastic muscles, an erect carriage, and a state of general physical fitness, possesses a very formidable equipment for the battle of life. His superiority to those less richly endowed physically will show itself in a great many ways.

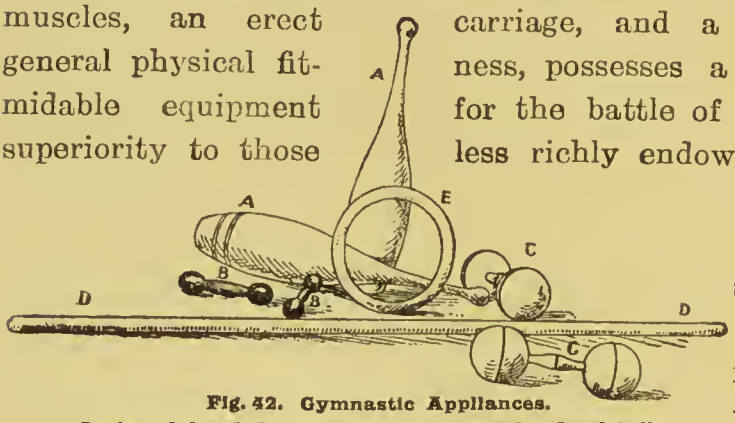


Fig. 42. Gymnastic Appliances.
a. Indian clubs; *b.* Iron dumb-bells; *c.* Wooden dumb-bells; *d.* Wand; *e.* Ring.

Exercise in moderation and the symmetrical development of the body are of the greatest value in maintaining a state of health and vital efficiency. Sufficient use of the muscles to keep them in good condition is favourable to the accomplishment of the best mental work.

Benefits of Exercise.

Firstly, it greatly aids digestion, thus improving the nutrition of all organs, including the brain.

Secondly, it quickens breathing, both in the lungs and in the tissues.

Thirdly, it also stimulates the circulation, sending the purified blood bounding through the arteries and into the minute capillaries throughout the entire body.

Fourthly, a good condition of muscular fitness usually brings sound, refreshing sleep, and a well-balanced nervous system.

Fifthly, and finally, it contributes to that calm self-possession, that well-balanced air, that combination of strength and gentleness, which is so attractive in either sex.

The Meaning of Flabby Muscles.

There are, of course, exceptions, but as a general rule, flabby muscles may be taken to denote a general mental, if not moral, flabbiness; while the training of the muscles, kept within the proper limits, wonderfully enlivens the spirits and the general tone of a person, mentally as well as physically. Study the lives of the men who have left their mark in the history of the world, and, though they may differ in many respects, you will find that they were mostly alike in possessing a certain firmness of muscular texture, and the ability to endure severe strain, physical and mental.

Exercises for Busy Men.

In this chapter we shall endeavour to give busy men and women some practical instruction in physical culture of a character suited to their requirements. We shall not aim to make Sandows of them, but rather show each how to improve physique, strengthen the weak organs, make firm the flabby muscles, increase chest capacity, reduce undue fulness at the waist, square the shoulders, round out the arms, im-

prove leg development, and, in short, make a more graceful, strong, and symmetrical man or woman.

All this can be done by means of the following very carefully arranged exercises, provided they are faithfully taken. Fifteen minutes daily is all that is absolutely required, though ten minutes in the morning and again in the evening will be even more satisfactory; and persons who are especially deficient would do well to make it fifteen.

Precautions.

Just a few general precautions before giving the exercises. *Put your whole heart into everything you do.* When taking arm exercises, let your mind power be concentrated on your arms—not painfully, but cheerfully and earnestly. When taking breathing exercises, do them also with a will and heartily, fixing the attention on the lungs and the muscles of respiration.

Take the exercises when you are feeling best. Never take them when physically weary. Endeavour at the same time to be regular, so that a certain hour each day will always find you busily engaged in this scientific muscle culture.

Have the room well ventilated, and, if possible, bright and sunny. Exercise always in a cheerful mood. Determine to enjoy the process of developing your muscles, for, as the poet well puts it,—

"No profit grows where is no pleasure ta'en."

In the interests of conciseness, we give here, in their proper order, some of the fundamental positions which will be used in the various combinations in the course of the chapter. The reader who expects to

take up physical culture in earnest will do well to familiarise himself with the terms applied to these positions.

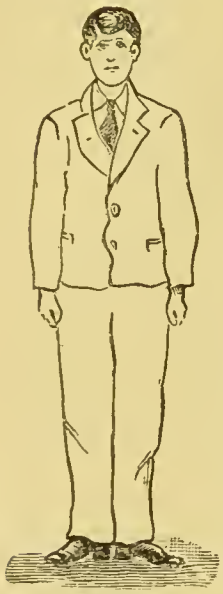


Fig. 43. Correct Standing.

1. Standing, Primary Position.

To take the correct standing position, stand with the back to a door or wall. The heels should touch each other, and the feet form a right angle. The heels, hips, back, and head should touch the wall, and the arms hang loosely. While maintaining the erect position, bend the head backwards as far as possible. This pushes the chest forward and upward, and separates the back from the wall. While maintaining this position raise the head, keeping the chin well in. Only the heels and hips now touch the wall, and the centre of gravity passes through the balls of the feet. Fig. 43. Test the position by raising the heels. If this can be done without throwing the body forward, the position is correct.

If the directions have been carefully followed, the position will be one of erectness, dignity, and grace, and pleasing to behold. More, it gives spring and elasticity to the step, and in walking minimises jarring of the spine. Such is the proper standing position for man. It gives freedom of action to the lungs and all the other organs of the body. At first the position will be tiring, if one is not accustomed to standing erect, and considerable practice may be necessary in order to make it a natural habit.

2. Sitting, Primary Position.

The chair or stool should be of such height as to allow the feet to rest comfortably on the floor. The trunk should be erect, the chest well forward, the head erect, chin in, and there should be a strong forward arch of the spine. Fig. 44. Sitting so that the spine



Fig. 44. Correct Sitting.
Here the trunk is erect, and the chest well forward.



Fig. 45. Incorrect Sitting.
Sitting in this stooping position cramps the chest and interferes with respiration, and also favours curvature of the spine.

arches backward is a pernicious habit that interferes with respiration. Fig. 45.

The proper way to sit down is to bend the knees and hips, keeping the trunk erect.

3. Walking.

Take the correct standing position, and constantly maintain the erect posture of the trunk. Bend the body forward from the hips, and step forward lightly, letting the weight of the body fall forward on the balls of the feet. The arms may swing at the sides.

Fig. 46. Walking is sometimes described as an intermittent falling forward, with a foot thrust forward just in time to prevent falling.



Fig. 46. Correct Walking.

There should be very little side sway of the body, and the step should be brisk and certain. If the position is correct, there will be a feeling of ease and elasticity that the old stooping gait could never give.

4. Climbing Stairs.

Most people make the mistake of stooping forward when going up stairs. Such an unnatural position makes the climbing difficult and laborious. Fig. 48. Walk up stairs as you would on the level, and you will be able to accomplish with comparative ease what is usually considered to be a wearisome task. A very slight forward bend of the trunk at the hip joints is all that is required to maintain equilibrium. Fig. 47.

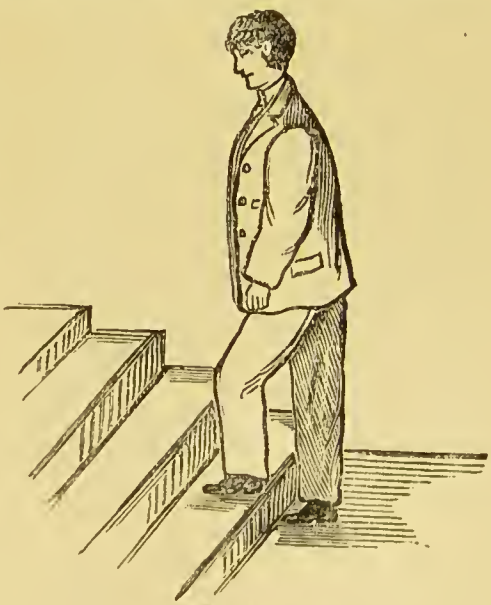


Fig. 47.
Correct position for climbing stairs.

5. Running.

Again the initial position is correct standing (1) with the chest well forward. The heels scarcely touch the



Fig. 48.
Wrong Position for Climbing Stairs.
This makes hard work of it.

ground, and, at each stride, both feet are off the ground for a moment. The elbows are bent, and the hands loosely clenched. The movement is really a rapid falling forward, the lower limbs coming forward to support the body and preventing a fall. Fig. 49.

Compound Standing Positions.

We shall now give a few compound standing positions which will be used in taking some of the movements to be described later. In all cases the correct standing position (see 1) is the basis of the position, the only difference being the position of the limbs.

6. Close-Standing.

The feet are close together, touching at the balls as well as at the heels. Fig. 50.

7. Toe-Standing.

Identical with correct standing, except that the heels are raised



Fig. 49. Running, Correct Position.

from the ground about two or three inches. Fig. 51.

8. Knee-Bend-Standing.

Similar to No. 1, except that the knees are bent to a right angle. Fig. 52.



Fig. 50. Close-Standing.



Fig. 52. Knee-Bend-Standing.

9. Wing-Standing.

Take the standing position (see 1), and then let the hands rest on the hips, with thumbs behind the fingers in front. The elbows form right angles, and are in the same plane as the trunk. Avoid bending the wrists. The arm and hand should form a straight line from the elbow to the tip of the index finger. Fig. 53.



Fig. 51. Toe-Standing.

10. Bend-Standing.

This is the same as No. 1, with the exception of the arms, which are close to the body, while the forearms are bent upward, the fingers resting on the shoulders. Fig. 54.



Fig. 53. Wing-Standing.

11. Heave-Standing.

In this position the upper arms are extended outwards, forming right angles with the trunk. The fore-arms are extended upward from the elbows with palms facing, and forming right angles with the upper arms. Both arms are in the same plane as the trunk. Fig. 55.



Fig. 54. Bend-Standing.

12. Rest-Standing.

The hands are placed behind the neck with palms forward and fingers touching. The elbows should be well back, in the same plane as the trunk. There is always the tendency to bend the head forward, which should be guarded against. It is an excellent position for expanding the chest. Fig. 56.



Fig. 56. Rest-Standing.

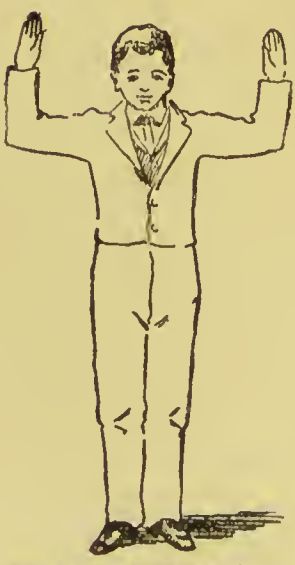


Fig. 55. Heave-Standing.

13. Stretch-Standing.

This is identical with No. 1, except that the arms are



Fig. 57. Stretch-Standing.

extended straight upward with the palms facing. Fig. 57.

14. Yard-Standing.

Take a correct standing position, as described, in No. 1, and then raise the arms outward to a level with the shoulders, keeping the fingers closed and the palms turned down. Fig. 58.

These positions may be used in taking most of the following movements and exercises. It is important to take each initial position accurately as described in order to derive the full benefit from the exercise.

Breathing Exercises.

Before describing the movements of the trunk and other parts of the body, we will give a few simple breathing exercises. They may be taken lying, sitting, or standing, according to the requirements of the individual case. See that there is plenty of fresh air to breathe.

15. Deep Breathing.

Take the standing position (1) and inhale slowly, filling the lungs to their utmost capacity. Then breathe out slowly. To breathe properly, there must be free action of the chest and abdominal muscles. During inspiration there should be an increase in the

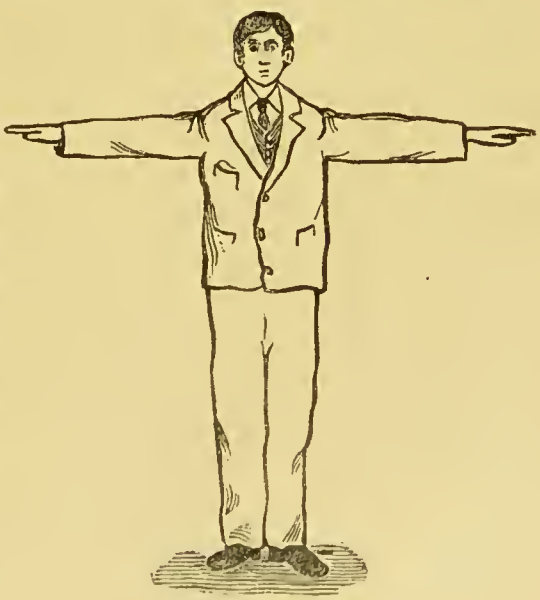


Fig. 58. Yard-Standing.

three diameters of the chest, antero-posterior, lateral, and vertical, as shown in the accompanying diagram. In expiration these same diameters are all diminished in size. Fig. 59. Constriction of any sort must be avoided. In breathing, use both chest and abdominal muscles. This is known as costo-abdominal breathing. Always breathe through the nose. Repeat three to twelve times.

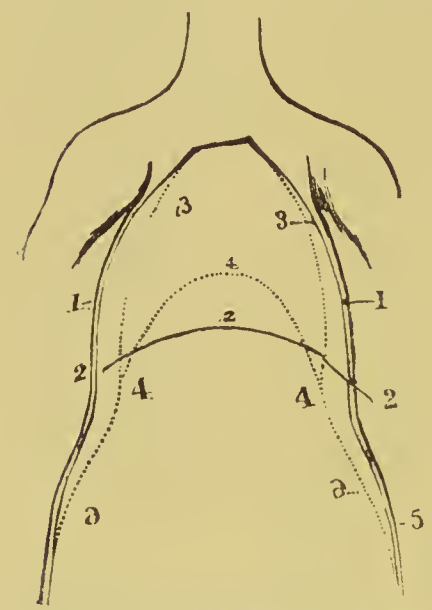


Fig. 59.
Diagram showing changes in the chest cavity during respiration.
1, 2, Straight lines, showing expanded chest; 3, 4, Dotted lines, showing contracted chest after expiration.

16. Deep Breathing, Holding the Breath.

Inhale the air as directed in No. 15, and, when the lungs are full, hold the breath for half a minute or longer, and then empty the lungs. Repeat three to twelve times.

17. Deep Breathing with Percussion.

This is the same as No. 16, except that, while holding the breath, the hands alternately strike the chest gently. Repeat three to twelve times. Fig. 60.

18. Deep Breathing, Sounding "Ah!"

This is similar to No. 15, but, in exhaling, the sound *ah* is made distinctly and clearly as long as possible. Repeat three to twelve times.

19. Explosive Breathing.

Inhale slowly to your full capacity, and then breathe out quickly. This exercise may be reversed, inhaling

quickly, and breathing out slowly, or the lungs may be filled and emptied rapidly. Repeat two to six times.

These breathing exercises may be combined with many of the following movements, and especially the raising of the arms upward above the head or extending them backward.



Fig. 60. Position for Chest Percussion.

Head Movements.

We shall only describe two movements of the head--bending and twisting—as follows :—

20. Wing-Standing, Head-Bending.

While maintaining the correct standing position, bend the head forward as far as possible. Fig. 61.

Then to the right, left, and backward. Repeat each flexion three to twelve times.

21. Wing-Standing, Head-Twisting.

Turn the head slowly to the right as far as possible, and replace.

Then to the left.

Alternately, right and left.

Repeat each three to twelve times.

Arm and Finger Movements.

These are some of the most interesting and valuable. Those involving the shoulders serve to strengthen the chest as well as the arms, and thus improve breathing. Unless otherwise directed, do them with vim and alacrity.

22. Arm-Raising, Forward.

Raise the right arm forward to a level with the shoulder, keeping it straight and well extended, with palm turned inward.



Fig. 61. Head-Bending, Forward.

Do likewise with the left arm.

Alternate, first the right arm and then the left.

Raise both arms together. Fig. 62.

Repeat each movement three to twelve times.

23. Arm-Raising, Outward.

This is similar to No. 22, except that the arms are raised sideways instead of forward. The palms should face downward.

Repeat each movement three to twelve times.

24. Standing, Arm-Raising, Backward.

This movement, too, is similar to No. 22, but in this case the arms are raised and extended backward as far as possible without straining. The palms face.

First raise the right arm backward, and then the left.

Alternate right and left.

Raise both arms together.

Repeat each movement three to twelve times.



Fig. 62. Arm-Raising, Forward.

25. Standing, Arm-Stretching.

While standing in the usual position, with arms at the side, reach downward with both arms as far as possible.

With arms extended sideways on a level with the shoulders, reach outward as far as possible.

Extend the arms forward on a level with the shoulders, and reach forward as far as possible.

Now extend the arms upward, as in "stretch-standing," and reach upward.

Repeat each movement two to six times.

26. Bend-Standing, Arm-Extending, Downward.

For the initial position, see No. 10.

Extend the right arm downward as far as possible, with the palm turned inward; likewise the left arm; then alternately; and lastly both together.

Repeat each movement two to six times.

27. Bend-Standing, Arm-Extending, Forward.

This is the same as No. 26, except that the arms are extended forward, with palms facing.

Repeat each movement two to six times.

28. Bend-Standing, Arm-Extending, Outward.

In this exercise the arms are extended outwards from the sides, with palms turned downward; first the right arm, then the left, then alternately, and lastly both together.

Repeat each movement two to six times.

29. Bend-Standing, Arm-Extending, Upward.

Extend the arms straight upward, with palms facing, in the order described for No. 28.

Repeat each movement two to six times.

30. Heave-Standing, Arm-Bending, Inward.

For this position see No. 11. Bend the fore-arms inwards, touching the shoulders with the fingers.

Repeat three to twelve times.



Fig. 63.
Heave-Standing,
Fore Arms Rotated,
Forward.

31. Heave-Standing, Arm-Extending.

Extend the arms outward with the palms turned up, keeping them level with the shoulders.

Repeat three to twelve times.

32. Heave-Standing, Fore-Arm-Rotating, Forward.

Rotate the fore-arms forward to a level with the shoulders. Fig. 63.

Repeat three to twelve times.

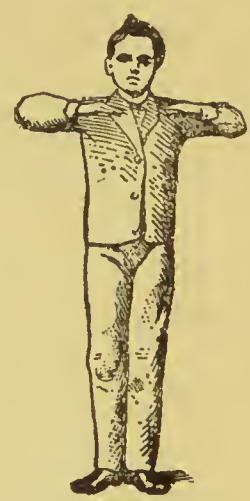


Fig. 65.
Inward Bend-Standing.

33. Standing, Arm-Twisting.

With the arms hanging at the sides, twist both outward. The arms must be kept at full extension during the twisting. Then twist inward, and lastly alternate the movements.

Repeat each movement three to twelve times.



Fig. 64. Rotating
Both Arms.

34. Standing, Arm-Rotating.

Bring the right arm forward, upward, and backward, describing as large a circle as possible with the pointed fingers. Keep the elbow well extended. Repeat two to six times.

Now reverse the movement, and again repeat two to six times.

Rotate the left arm in like manner.

Now rotate both arms together, first

in one direction, and then in the other. Fig. 64. Repeat each two to six times.

35. Standing, Swimming.

Take the correct standing position, and bend the arms inward with palms turned down and fingers touching. The elbows should be on a level with the shoulders. Fig. 65. Now extend both arms forward with palms turned outward, then back as far as possible, then return to the initial position.

Execute the movements with precision and vim.

Throughout the different positions, the arms should always be kept well extended, and at the same height as the shoulders.

Repeat three to twelve times.

36. Standing, Arms-Flinging, Backward.

Take the same initial position as described for swimming (No. 35). With one movement quickly throw the arms backward as far as possible, still keeping them at the same height as the shoulders.

This is an excellent exercise to develop the chest and increase the breathing capacity

Repeat three to twelve times.

37. Standing, Fingers-Bending and Extending.

Clench both hands and then extend the fingers alternately. Considerable vigour should be put into these flexions and extensions.

Repeat three to twelve times.

Trunk Movements.

Movements of the trunk should be taken rather slowly and deliberately as a rule. In this way the greatest benefit will be derived.



Fig. 66. Trunk-Bending, Forward.

38. Wing-Standing, Trunk-Bending, Forward.

Bend the trunk forward from the hips, keeping a strong inward curve in the back as in the correct standing position. Fig. 66. Repeat three to twelve times.

39. Wing-Standing, Trunk-Bending, Backward.

This movement is somewhat difficult, and due care should be taken not to strain the back. At best, the backward bending will be comparatively slight; nevertheless, the movement is a vigorous one if taken properly.

Take the wing-standing position, and then bend the trunk backward, keeping the relative position of the head the same as in standing. If correctly done, the body will form a bow from heel to head. Fig. 67.

Repeat two to six times.



Fig. 67. Trunk-Bending, Backward.



Fig. 68. Trunk-Bending, Sideward.

40. Standing, Trunk-Bending, Sideward.

Take the standing position, and bend the trunk to the right as far as possible. Don't let the head drop to the side. Repeat three to twelve times. Fig. 68.

Do likewise to the left side.

41. Wing-Standing, Trunk-Twisting.

Twist the trunk slowly to the right as far as possible, without straining, and

then return to position. See that the twisting is in the spinal column above the hips, the latter remaining in the usual position during the movement. Fig. 69.

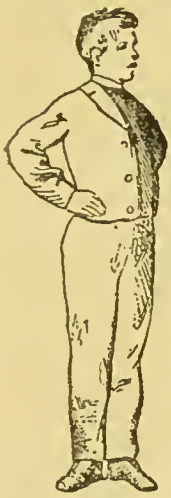


Fig. 69. Trunk-Twisting.

Leg and Foot Movements.

Many of these movements require careful balancing, and hence must be taken very accurately. There is always a tendency to neglect the position of the trunk in doing leg movements, but this is a mistake. The trunk should be kept erect, as described in the correct standing position.

42. Wing-Standing, Leg-Extending, Sideward.

Extend the right leg to the same side as far and as high as possible. In taking this and similar movements, do not allow the body to sway to the opposite side, but constantly maintain the erect position of the trunk. Fig. 70.

Do the same with the left leg.

Then alternate right and left.

Repeat each movement two to six times.



Fig. 70. Leg-Extending, Sideward.

43. Standing, Leg-Extending, Forward.

Extend the right leg straight forward as high as possible, keeping the knee extended, and maintaining the correct poise of trunk.

Extend the left leg in the same way; then alternately right and left, repeating each two to six times. Fig. 71.



Fig. 71. Leg-Extending, Forward.

44. Standing, Leg-Extending, Backward.

Extend the right leg backward as far as possible, again keeping both knees straight, and the trunk erect. Fig. 72.

Do likewise with the left leg, and then alternately, right and left. Repeat two to six times.

45. Wing-Standing, Leg-Twisting.

While standing on the left leg, raise the right slightly, and twist it vigorously to the right, keeping the knee extended; then to the left, and alternately, repeating each movement two to six times. Do likewise with the left leg.



Fig. 73. Leg-Lifting.

46. Standing, Leg-Lifting.

Raise the right leg forward, so that there will be a right angle at the hip-joint, and also at the knee-joint. Fig. 73.

Now raise the left leg in the same way.

Repeat each three to twelve times.



Fig. 72. Leg-Extending, Backward.

47. Standing, Leg-Bending.

Bend the right leg so that a right angle is formed at the knee. The thigh is to be kept parallel with the other limb.

Bend the left leg in the same way. Fig. 74.
Repeat each three to twelve times.

48. Wing-Standing, Knee-Bending.

Bend the knees to a right angle, if possible, keeping the heels on the ground, and the trunk erect.

Repeat three to twelve times.



Fig. 74. Leg-Bending.

49. Wing-Standing, Heel-Raising.

Rise on the toes as high as possible. Repeat three to twelve times.

Combination of Movements.

The foregoing exercises may be combined with different positions, which give variety and render the exercises more or less difficult. For example, head-bending may be taken in the ordinary standing position (No. 1) or in certain compound positions, such as: close-standing, a little more vigorous; toe-standing, requiring still more energy; wing-standing, a comfortable and easy position; bend-standing; heave-standing, a little more difficult; rest-standing, more difficult; and stretch-standing, more vigorous. These various positions are fully described in Nos. 6 to 14 inclusive. Some of them may also be combined with the sitting and lying primary positions, thus giving a still larger variety of exercises, and allowing them to be graded according to the physical condition of the individual case.

Several exercises, too, may be combined together. For example, arm-raising with heel-raising. Space forbids us to give more than a very few of these compound

exercises, but the number may be augmented almost indefinitely.

50. Deep-Breathing, Arms-Raising, Backward.

Stand with the arms at the sides. While inhaling the air, raise the arms backward. This movement pushes the chest forward and upward, and thus favours respiration.

Repeat two to six times.

51. Deep-Breathing, Arms-Raising, Forward, Upward.

While breathing in, slowly raise the extended arms forward and upward until directly above the head. The arms should be kept parallel and extended, and the palms facing. The air is exhaled while the arms are slowly returned to position.

This and the following exercise should be taken with deliberation. An effort should be made to reach as far as possible with the fingers while executing the movement.

Repeat two to six times.

52. Standing, Arms-Stretching with Heel-Raising.

This is the same as No. 25, except that each time both arms are stretched the gymnast rises on his toes.

Repeat two to six times.

53. Close-Standing, Arms-Raising.

See No. 6 for the initial position. Raise the arms as directed in Nos. 22, 23, and 24.

54. Wing-Close-Standing, Heel-Raising.

The initial position is a combination of wing-standing and close-standing. Raise the heels as high as possible from the floor.

Repeat three to twelve times.

55. Bend-Close-Standing, Arm-Extending.

This is a combination of bend-standing and close-standing.

For directions for the exercise, see Nos. 26 to 29 inclusive.

56. Wing-Toe-Close-Standing, Knee-Bending.

The initial position is a combination of toe and close-standing with the hands on the hips (wing-position).

For the movement see No. 48.

57. Rest-Close-Standing, Heel-Raising.

The initial position is a combination of rest and close-standing (Nos. 6 and 12).

Many other movements may be taken from this position, such as Nos. 38, 40, 41, 46, and 47.

58. Rest-Toe-Standing, Trunk-Bending.

Here we have a combination of rest and toe-standing (Nos. 7 and 12).

For the trunk-bendings see Nos. 38 to 40.

Other movements may also be taken from this position, such as Nos. 42 to 48.

59. Wing-Sitting, Head-Bending.

The hands are placed upon the hips the same as in wing-standing.

For the exercise see No. 20.

60. Wing-Sitting, Knees-Opening and Closing.

Separate the knees a foot or more, and close them again. The heels should remain touching during the exercise. Figs. 75 and 76.

Repeat three to twelve times.

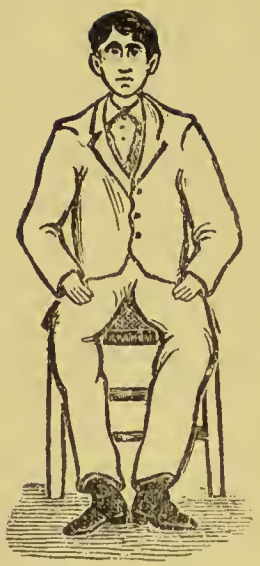


Fig. 75. Wing-Sitting, Knees Open.

61. Wing-Toe-Standing, Jumping.

This and the following exercises are quite vigorous and proper care should be taken to avoid strain or over-exertion.

The initial position is a combination of wing-standing and toe-standing. Bend the knees to a right angle, and then make a light jump in place, coming down on your toes, and with knees bent.

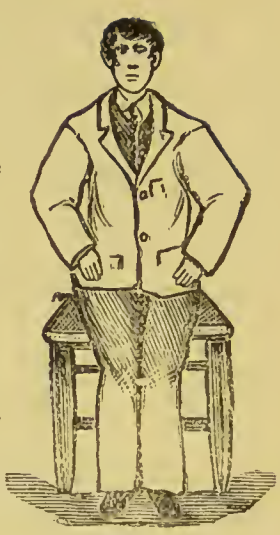


Fig. 76. Wing Sitting, Knees Closed.

Repeat two to six times.

This exercise may be varied by jumping forward, sideward, or backward.

62. Stretch-Standing, Trunk-Bending, Forward.

Take the correct position and bend forward and downward, trying to touch the floor with the fingers. If impossible to touch the floor at first, practice will soon make it easy. Fig. 77. Avoid straining.



Fig. 77. Trunk Bending, Forward.

Repeat two to six times.

Flexion and Resistance.

In concluding the exercises, we will briefly describe a very simple yet effective method, which we may call flexion or extension with resistance.



FIG. 78. FLEXION AND RESISTANCE OF THE ARMS.



FIG. 79. FLEXION AND RESISTANCE OF THE ARMS AND HANDS.

Bend the fingers of the right hand slowly, at the same time opposing the flexion by the extensor muscles. It is possible to put eonsiderable energy into the exereise. After eomplete flexion, extend the fingers slowly, at the same time opposing extension by the flexor muscles.



Fig. 80. The Arm Strongly Flexed.

If both hands are closed at the same time, and then the wrists and elbows flexed in turn, the movement becomes a very powerful one. See Figs. 78, 79, and 80. Any group of flexor or extensor muscles may be exercised in the same way.

Daily Programme.

The following programme of exereises has been prepared for those who wish to do them systematieally. There are ten groups, and each group may be taken daily or twice daily for a week or longer.

I.	15,	16,	20,	23,	49,	38,	39,	25,	46,	26,	27,	21.
II.	15,	17,	22,	40,	28,	29,	42,	30,	48,	37,	20,	35.
III.	15,	18,	24,	41,	33,	43,	31,	40,	45,	36,	47,	21.
IV.	15,	18,	19,	32,	38,	39,	34,	44,	35,	20,	46,	24.
V.	15,	16,	17,	26,	40,	30,	49,	34,	39,	27,	28,	48.
VI.	15,	16,	18,	22,	38,	39,	43,	36,	20,	46,	41,	25.
VII.	15,	50,	17,	27,	28,	29,	40,	35,	45,	54,	53,	21.
VIII.	50,	16,	20,	26,	27,	28,	41,	42,	37,	34,	57,	61.
IX.	51,	17,	19,	53,	58,	52,	41,	56,	55,	60,	36,	48.
X.	50,	51,	17,	54,	62,	46,	35,	40,	37,	48,	33,	58.

CHAPTER III.

Physical Deterioration.

PHYSICAL deterioration is a subject which has been much to the fore of late years in Great Britain, America, and other highly civilised nations.*

Army recruiting sergeants complain that the material they have to draw from is not as good as it used to be, the percentage of rejections on the score of unsound organs or poor development being greater than, to their knowledge, it ever was before. Moreover, the birthrate is slowly but steadily decreasing; more infants die under a year old than was the case half a century ago; and cancer, a disease especially affecting persons whose tissues have low resisting powers, is increasing at an alarming rate.

Physical Inferiority.

While loath to admit such a thing, we can hardly deny that there has been some deterioration in health and physique — that, though living in an age when

*At a Mansion House meeting in the interests of the national health, held in London on the 28th of June, 1905, Sir James Crichton-Browne made the following stirring remarks:

"If anyone has any doubts as to the ravages and the existence on a large scale of physical deterioration, I would recommend him or her to consult a report on the social condition of Dundee [Scotland], published within the last three months. That report is a startling human document, and justifies the remark of the committee of influential citizens responsible for it, that it reveals a very serious state of things, deserving the anxious consideration of all thoughtful persons. I am not going to trouble you with details of the report, but I should like to say that it sets forth the results of the minute examination of 1,000 children in Dundee in elementary schools, proceeding on the lines already followed at Glas-

knowledge of every kind is generally diffused, when the conditions of life in some respects are better than ever before, and the average standard of education vastly higher than it was a hundred years ago—yet, in physical development, in downright animal vigour and nerve force, we are inferior to our ancestors.

It may be argued that a diminishing deathrate tells another tale, but it does nothing of the kind. Our deathrate is lower than it used to be because, as a result of public hygiene and sanitation, we are saved the enormous ravages of bubonic plague, smallpox, typhoid fever, and some other diseases which, in former days, decimated cities, carrying off the weak and unfit, thus, in a sense, improving the average standard of health and physique.

To-day, our system of public hygiene and sanitation, and the skill of surgeon and physician, enable us to keep our invalids and semi-invalids alive for many years, and thus lower the deathrate, but without increasing our vital efficiency. In fact, as just pointed out, the real effect is rather to reduce it.

Tendency of Modern Life.

We have, then, to face the fact that the tendency

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gow, Edinbnrgh, and Aberdeen, bnt carrying the investigation further, and carrying it ont with minute and scrupulous care. We all expected to be told that amongst the school-children decay of the teeth, or caries, is all but nniversal; that as many as thirty-threo per cent. suffer from defects of vision, requiring correction by spectacles; that as many as forty-three per cent. suffer from deafness, enlarged tonsils, adenoids; but it was beyond expectation to discover that, of these young children attending school, as many as nineteen per cent. suffer from diseases of the glands, almost always of a tuberoular natnre; that as many as five per cent. suffer from disease of the bones; that as many as nine per cent. suffer from disease of tho lungs; and, what is most astonishing, that seven and a half per cent. suffer from disease of tho heart; whilo a much larger number show a flabbiness and weakness of that organ, the effects of nnderfeeding or of over-exertion. Positively after reading this report, one asks in painful astonishment, 'Is tho whole mass rotten? and is thero one sonnd, perfectly healthy child left?'"

of modern life is, from a physical standpoint, downward. We have wandered far away from nature, and are suffering the consequences. It behoves us to make strenuous efforts, before it is too late, to amend our ways, and by adopting a more natural mode of living to arrest the downward course. Nay more, we must do our best to go on and inaugurate radical reforms in the way of better housing, and public sanitation, and a wider diffusion of health principles amongst the people, with a view of building up a strong, healthy nation which shall be as noted for the symmetrical development, the vital efficiency, and radiant health of its people as this nation is now noted for its great wealth and commercial prosperity. In other words, we must realise that we have an imperial health problem to solve.

Cause of Deterioration.

What is the cause of present day deterioration? Many different reasons have been suggested. We believe that one of them is the desertion of the country with its free, healthy, outdoor life, and the crowding into the cities. Overcrowding and much suffering are inevitable under present conditions of city life. Most city workmen are living week by week from hand to mouth; they do not lay up anything. Hence temporary lack of employment means to them immediate want, and if they are not already in the slums, they will drift there, and, in the course of time, become dependent on the rates.

Children of the Slums.

How is it with the children of the slums? They are absolutely cheated out of their rightful heritage



BACK TO THE LAND.

of sunshine, fresh air, and green fields; they are hampered on every hand, and if they escape death in infancy, grow up pale, sickly, and ill-developed. Some live lives of shame, others become inefficient factory hands or inferior soldiers; only a few attain to real usefulness—all because they never had a fair chance.

Dignity of Labour.

Country life is avoided by some because it is necessarily a laborious one. The cause of some of the industrial evils of the present day is the aversion to hard work. Men will do almost anything to get money except work for it with their hands. The dignity of useful labour, especially that primal duty of cultivating the soil, should be taught in our schools, and advocated from the lecture platform, and by the public press. As the Duke of Devonshire remarked in a recent address, the tendency of our present educational system is to make clerks of all the brightest boys, whereas a proper proportion should be encouraged to look to the soil for their living. The man behind the plough is a personage of greater importance to the welfare of the empire than is generally realised, and the encouragement of a healthy love of the soil, and a pride in getting the best returns for one's labour by employment of the most approved methods, would foster a new kind of imperialism, having as one of its results the improving of the nation's physique.

Advantages of Useful Work.

Athletics are very good in their way, but they are not everything. Useful work out-of-doors is real and satisfying to a degree that athletics never can be, and the cultivation of a love for such pursuits will put

new thoughts into our youth, and give them an insight into the real meaning and dignity of life such as they can never get from reading cheap story-papers and novels, attending football matches, and frequenting theatres and music halls. Yes, and the work will give them firmness of muscle, a healthy appetite, and that sound nervous system which is so conspicuously wanting in these days.

The subtle influences for health which the country life affords are much more powerful than we think. We are only just awaking to the fact that consumption, that great "white plague" which carries off more people than all other infectious diseases put together, is largely a result of breathing foul air. But other maladies are also due to poisoned air, and notably that general decline in physical vigour which is so characteristic of the people of to-day.

Smoke-Laden Air of Cities.

The air of our large cities is heavy with smoke, dust, and other impurities. To persons of sensitive organisation it is a wonderful relief to get only a few miles out of such places as London, Glasgow, or New York. Life seems to take on brighter hues, the whole outlook is changed for the better, disappointments lose their sting, and hope springs up anew. Then there is a companionship with nature which, all unconsciously, steadies the nerves, builds up the vitality of the whole body, and infuses a peaceful calm in the place of that restless, excitable state which city life fosters.

The green fields and smiling valleys covered over with corn, the peaceful herds, the quiet life of the domestic animals, the regular work free from excite-

ment and perfectly wholesome, all help to build up body and mind alike, and fit one for the real duties of life.

The Workman's Cottage.

It is not contended that all should give themselves to farming. Let our city labourers, however, cultivate a little garden wherever possible, and endeavour to raise their own vegetables, or, at least, a portion of them. Why should we not have in the outskirts of all our large cities groups of cottages of a new kind, with generous gardens attached, in which the labourers can at least get a taste of the country, and from which they can supply their own tables with fresh vegetables? That which affects the health and well-being of the workingman affects the nation as a whole. And if we are going to raise the standard of the national health and physique, it will not be done without some radical changes in present-day methods.

Bournville, Port Sunlight, and the new Garden City near Hitchin (England) afford the best tangible proof that comfortable houses surrounded by delightful gardens can be furnished to the labouring classes at a reasonable rental, and that with such wholesome surroundings the birthrate tends to increase, while the deathrate falls very materially.

CHAPTER IV.

Beauty Culture.

BEAUTY culture, as ordinarily understood, consists mainly in the use of various lotions, ointments, and powders for the complexion, the attempted removal of slight blemishes, face steaming and massage to remove or ward off wrinkles, and other similar procedures.

External Applications Unsatisfactory.

Ordinary beauty culture is almost entirely an external art, and does not allow for natural growth and development, but rather attempts to work against nature by arbitrary and unscientific methods. Consequently its results, whether judged from a physiological or an artistic standpoint, are eminently unsatisfactory.

There is a superficial beauty which is sometimes successfully imitated, but it has no wearing qualities; moreover, it is foreign to its possessor, whom it seems not so much to clothe as to disfigure.

Real Beauty.

Lasting beauty—beauty that is real and genuine as compared with that which is "put on" by means of paints and powders and various deceptive arts, is best cultivated from within. In fact, it has its source within, for all true physical beauty is but the outshining of the soul.

Emerson tells us: "The fountain of beauty is the heart, and every generous thought illustrates the walls of your chamber."

"Then it doesn't matter how we treat our bodies," someone may say, "if beauty is a spiritual thing." Yes, it matters a great deal, for if the glass is dingy and coated over with filth, the image it conveys will be a blurred one. Thus many a beautiful and cultured mind must, owing to the neglect of beauty culture of the right kind, look forth through a body disfigured by disease.

How, then, shall we cultivate that condition of the body which will enable it most perfectly to reflect the beauty of the soul within? This is surely no small, insignificant matter, but one in which everybody must be interested.

No True Beauty Without Health.

First, there can be no true beauty without health. The clear sparkling eyes, the rosy cheeks, the transparent skin—are not all these so many signals that Nature hangs out to show that all is well within? Then, whatever is injurious to the health of the body must also spoil its beauty; and, on the other hand, that which makes for health and long life, likewise makes for beauty.

A soft, transparent skin is one of the things every woman longs to have. Fortunately it is susceptible of cultivation; but no amount of mere external treatment will effect the desired end. The skin on the outside of the body bears a close relation to that on the inside. A coated tongue, a bad taste in the mouth, slow digestion, a sluggish liver—these are the usual

accompaniments of a sallow, muddy complexion, and they also show where the real trouble lies. Nature cannot hang out her rosy banner because the internal conditions are not satisfactory.

Rational Beauty Culture.

A cleansing process is called for. Plenty of pure, soft water, drunk freely between meals, immediately on rising in the morning, and just before retiring, will do much to rid the body of accumulations of waste just as real in their way as the garbage heaps that encumber a neglected backyard. Vapour and electric light baths will greatly assist the elimination through the skin, and thoughtful regulation of the diet will remove any tendency to constipation that may be present. The cold morning bath will improve the circulation, and quicken all the organs to renewed life and activity.

Soft water also should be used freely on the face. There is no objection to the occasional application overnight of a good cold cream, but the next morning every particle should be carefully removed with pure water, otherwise the pores of the skin are clogged, and a muddy complexion results.

Face steaming is also beneficial, but is usually not necessary, when water is drunk freely and the system is kept in a clean, wholesome condition by means of warm baths twice a week, and the morning cold dip or sponge bath.

Soft water is essential to the best conditions of both face and hands, and it can be easily made by adding strong ammonia to hard water at the rate of a teaspoonful to a gallon.

Exercise as a Beautifier.

Daily exercise out-of-doors is a wonderful beautifier. It improves the circulation, gives tone to the nerves, rounds out the muscles, and imparts stay and stamina to the system. Brisk walking with chest well expanded, shoulders back, and arms hanging naturally at the sides, is the best all-round exercise. Riding, cycling, tennis, croquet, and golf are all very good taken in moderation. Working in the garden is also excellent provided care is taken to avoid an undue amount of stooping, which contracts the chest.

Lessons from Nature.

Love of nature in all her moods, and keeping oneself open for the lessons taught by field and flower and running stream, help to clear the mind of petty worries and give it freshness and vivacity, as well as to impress a natural beauty upon the body. Such is the teaching of those beautiful lines from Wordsworth describing the rearing of an ideal girl:—

"The stars of midnight shall be dear
To her; and she shall lean her ear
In many a secret place
Where rivulets dance their wayward round,
And beauty born of murmuring sound
Shall pass into her face.

"And vital feelings of delight
Shall rear her form to stately height,
Her virgin bosom swell."

A World of Beauty.

The Creator has placed us in a world full of beauty if we only knew it. The ever-changing panorama of the sky, the smiling fields and deep green woods of summer, the rich autumnal tints, the pure snow of

winter, and the fragrant beauty of the orchards in spring — what are all these but an environment of natural comeliness meant to nourish the love of beauty in the human heart?

Good digestion is essential to good looks. Take jealous care of your stomach and liver. Feed on pure, wholesome viands, to the exclusion of rich, indigestible, highly spiced, and clogging foods. Face lotions are good enough in their way, but the most effective skin beautifier, according to a noted physician, is a preparation of oranges, apples, and grapes applied not to the face but to the inside of the stomach. In other words, a diet composed largely of fruit is conducive to a smooth, healthy skin.

Adopt a Simple Diet.

Cultivate a taste for simple, natural foods; avoid rich, complicated dishes as you would the plague. They are invariably beauty destroyers. Good hard bread, well-baked, may be taken at every meal, and will be found distinctly superior to cakes and pastries of all sorts.

The manner of eating is almost as important as the nature of the food. Eat slowly, chewing every morsel thoroughly. You will not eat so much this way, but you will get more out of what you eat, and will avoid filling your system with an excess of nourishment, which causes weakness and predisposes to disease.

Early Rising.

Rise early if you would keep fresh and young. Gas-light may be very effective in hiding a sallow complexion and passing off the "made up" beauty as if it were genuine; but gas light is no better for a fresh young girl than for a plant. Therefore, go early to bed and be

up with the dawn. Late hours and fashionable dissipation make "pasty" complexions, weaken the nerves, and bring on premature age.

Spending one's evenings in the close stifling air of a poorly ventilated theatre is another way to destroy health and beauty. Sunlight, on the other hand, is a natural beautifier. A morning walk before breakfast brings natural colour to the cheeks, and awakens an appetite for simple, wholesome food.

A graceful carriage, which is one of the elements of beauty, may be cultivated by practising the light gymnastics given in the chapter on Physical Development. Swimming is also a capital exercise for those who wish to acquire ease and grace of movement.

Deep breathing, practised night and morning, will do wonders in the way of broadening and deepening the chest, and filling up the unsightly hollows of the neck and chest.

Things to Avoid.

There are some things which beauty culturists need especially to avoid. Here, then, are a few don'ts that may prove useful:—

Don't drug yourself with patent medicines. They will ruin your teeth and digestion, and will do you no good.

Don't wear stays; they are unnatural, unphysiological, and unhealthful; they upset the circulation, hinder proper breathing, displace the abdominal organs, and cause aches and pains innumerable.

Don't patronise so-called "beauty doctors." Their methods savour of empiricism; they may do you a good deal of harm; they will hardly do you any good.

Don't attempt to effect any radical change in your features or figure. Nature has established a certain harmony of form and colour which must be maintained at

all hazards. The results of interference with the natural order is really to magnify rather than to remove the defect.

Don't indulge in late suppers.

Avoid pork, pickles, vinegar, oysters, and gross, clogging foods generally.

Be sparing in the use of sugar and sweetmeats.

Don't forget that beauty culture is, at the bottom, character building. As the athlete must exercise self-dénial in order to develop his muscles to the highest pitch, so must the aspirer after true physical beauty deny perverted appetite, and maintain strict control over passion, in order that all the bodily organs may work together harmoniously, and the whole system respond as a perfectly tuned instrument to the movings of the soul within.

Importance of Self-Control.

Self-control must extend even to the thoughts. Nothing so much as bordering on impurity is to be allowed to lodge in the mind: for the face is a kind of wax tablet upon which, sooner or later, all the thoughts that have found lodgment within are written in plain characters, to be read by the world.

Finally, there can be no true beauty culture without happiness, and happiness, while sought in vain for selfish purposes, comes of its own free will to those who set about most heartily the work of making others happy. The most powerful moral aid to beauty is a truly unselfish life, devoted to the highest ends, and the disposition, which can be easily cultivated, of looking to the needs and welfare of others. Selfishness mars a countenance of the most elegant proportions, while loving care for others brightens, softens, and transfigures the plain face, and makes it shine with heavenly light.

CHAPTER V.

Healthful and Artistic Dress.

DRESS reform is one of the live questions of the hour. Thoughtful women have long rebelled against the tightly-laced corset and the long, dragging skirts; but so powerful is custom, and so nearly universal the belief that it is beautiful and womanly to have a small waist, that the reform proceeds very slowly.

Medical men have for years condemned the corset as unphysiological to a high degree, and calculated to cause serious injury to the vital organs. This is a matter in which, we believe, members of the medical fraternity are well nigh unanimous. Some physicians go so far as to say that in their opinion fully one-half of the maladies peculiar to women, and which are more prevalent to-day than ever before, are due to the cruel and unnatural custom of tight-lacing.

Evil Effects of Tight-Lacing.

What are some of the principal effects of the use of the corset? First, the lungs are seriously hampered in their work. These elastic, sponge-like organs are by the corset so compressed and crippled that they can fully expand only in their upper lobes; thus a good portion of the lung surface is rendered practically useless for breathing purposes, and the victim does not take in sufficient oxygen to aerate the blood properly. Impure blood and an insufficient supply of oxygen for the tissues in the body naturally follow. Furthermore, the lower

portions of the lungs, being unused, present a favourable soil for the tuberculosis germs which always lurk about, and are especially likely to attack persons whose constitutions are weakened by deficient breathing.

Secondly, lacing seriously hinders the circulation of the blood. Tie a tight band round the stem of a flower, and it will soon wither away because the flow of sap is interfered with, and the flower does not get its full share of nourishment from the plant. A tightly-laced corset unbalances the circulation of the human body in a similar way; some parts are congested with blood, other parts do not get a proper amount; the result is often cold extremities, an overheated brain, and much general discomfort usually attributed to other causes

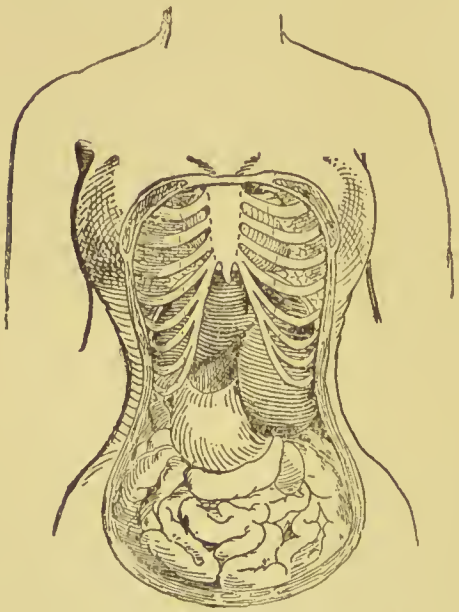


Fig. 81. Effects of Tight Lacing.
The internal organs are crowded out of their normal position.

Displacement of the Internal Organs.

Thirdly, waist constriction causes displacement of the abdominal organs to an extent not generally realised. If medical men were to speak plainly, and tell women who affect the wasp-waist that their stomachs are four or five inches below the proper position, that the liver is cramped and constricted, and other abdominal organs are similarly displaced, it might make them think seriously of making reform, yet in numerous cases just such things have happened. Indeed, a prolapsed

stomach is the rule rather than the exception among women, just as corsets are the rule. Some members of the fair sex actually think it is necessary *to keep the stomach down*, whereas the proper working of the organ requires that it should be allowed to remain just where the Creator placed it, *well up in the body*, right under the lung and behind the lower ribs.

Dr. J. H. Kellogg, who has given much special thought and study to the effects of tight-lacing, recently made a careful examination of the position of the stomach, liver and bowels in fifty workingmen and seventy-one working-women, all supposed to be in ordinary health. We quote the result in his own words:

Dr. Kellogg's Investigation.

"In the seventy-one women examined, prolapse of the stomach was found in fifty-six cases. In nineteen of these cases the right kidney was found prolapsed, and in one case both kidneys. The fifteen cases in which the stomach and bowels were not prolapsed, were all persons under twenty-four years of age. None of these had ever laced tightly, and four had never worn corsets or tight waist bands, having always worn the clothing suspended from the shoulders."

Only six of the men had prolapse of the stomach and bowels, and of these "in only three cases was the extent of the prolapse anything at all comparable with that observed in the women." These three, the doctor found on inquiry, had used a belt or something equivalent as support for the trousers. In one of the men the right kidney was prolapsed.

It will appear from these figures that prolapse of the stomach and bowels is six times as frequent among

women as among men, and no one understanding the effects of the corset can have any doubt as to the cause.

But it is not merely that these organs are pushed out of their proper places, thus causing a kind of deformity; they are also hindered in the proper exercise of their functions. The stomach pressed downward out of its normal position cannot properly empty itself; consequently food remains in the organ longer than it ought, and digestion is slow and unsatisfactory, and accompanied by various unpleasant symptoms.

Moreover, the stomach and liver and other organs are fastened in their places by ligaments and muscles, all of which are supplied with nerves. The pulling and stretching of these delicate fastenings causes much pain and discomfort. Thus backaches, headaches, wandering pains, "dragging down" sensations, and the weariness often complained of, may usually be traced to the harm done by the corset.

A Reserve of Vitality.

Young ladies who aspire to the wasp-waist are very apt to say, when warned of the harmfulness of lacing, "But my stays do not hurt me in the least; I am in perfect health." And it may be admitted that long-suffering Nature does not usually inflict her penalties at once. The girl grows up, and is married, in all the bloom of young womanhood. But then when she takes up the cares and duties of motherhood, and needs an extra supply of vitality to draw upon, she not infrequently finds herself a physical bankrupt. The days of vigorous abounding youth, which should have been given to storing up strength and vitality for the future, were wasted; Nature's reserve force was ruthlessly squandered; and

now when the real burdens of life begin to press heavily, the wife and mother finds herself ill equipped to meet them. How often she quickly loses the bloom of health, and joins the great company of women in search of some nostrum that will remove the results of youthful folly. She finds plenty of quacks who promise to do wonders, but performance of the promise is quite another thing. One noticeable feature of such cases is that only in a few instances does the victim herself or her friends associate her condition of semi-invalidism with the violence she has done her body through tight-lacing. Yet something might be learned from the fact that the female disorders so exceedingly common in civilised countries, are practically unknown amongst the women of savage tribes, as well as amongst Chinese and Indian women, who do not thus abuse their bodies.



Fig. 82. Natural and Deformed Figures. Deformity Produced by Tight Lacing.

The Wasp-Waist a Deformity.

A word should be said about lacing from the artistic point of view. Is an abnormally small waist beautiful? We answer, No. In the first place, it must be out of

proportion with the rest of the body, and therefore something of a monstrosity. Some women are naturally slender and willowy, and in such persons a reasonably small waist may, if left to develop on natural lines, be attractive; but if an effort be made to reduce it to still smaller dimensions, the effect as an artistic whole is spoiled. A person of naturally more robust proportions cannot by any possible process of lacing make herself one whit more slender than she really is; the effect is simply to proclaim to all discerning people that she is unsatisfied with the proportions naturally belonging to her, and has tried her best to alter things to suit herself, but has miserably failed in the attempt. No, corsets do not deceive anyone except the wearer, who may possibly think because she has worked so hard to cheat her abdominal organs of a few inches, that she has accomplished wonders in the great art of figure-making: but the effect to one who has a true sense of beauty and proportion is utterly disgusting. Fig. 84.

Freedom of movement is one of the first essentials to a truly beautiful woman, as all great poets and artists declare.

Take those familiar lines:

> "Her grace of motion and of look, the smooth
> And shining majesty of step and tread,
> The symmetry of form and feature set
> The soul afloat, even like delicious airs of flute
> and harp."

And again:

> "Grace was in her steps, heaven in her eye,
> In every gesture, dignity and love."

But no woman can be at ease and graceful while strapped up, at least so far as the waist is concerned, something like an Egyptian mummy. Therefore corsets are utterly inartistic, and a hindrance to the development



FIG. 83. THE VENUS DE MILO.



FIG. 84. A FASHION-DEFORMED WOMAN.

of grace and beauty as well as being unphysiological and unhealthful.

Corsets a Source of Danger.

We have said a good deal about tight-lacing; but we would like the reader to understand that we consider all lacing abnormal. Few women will confess to wearing their clothes tight. The fact is that the corset worn in any shape is a dangerous thing. More than that, any system of suspending the skirts from the waist is harmful. Serious effects in the way of abdominal displacement have resulted from the use simply of tight waist bands without corsets. Ideal clothing should fit the body naturally at the waist and hips; it should not really hang from any part; but so far as any weight is to be borne, that work is to be done by the shoulders.

An Adjustable Bodice.

A neatly fitting bodice can be made by any intelligent dressmaker to which may be buttoned all the skirts. If properly made the bodice will fit the figure snugly without harmful pressure. There is an adjustable bodice, which has an elastic arrangement of the parts which allows the most perfect fitting without pressure, and gives a far more artistic and beautiful effect than does the work of the most perfect corset fitter, because it is devised to fit the delicately rounded contour peculiar to woman, in which consist her beauty and her charm. It is owing entirely to a misconception that some woman think that to dress healthfully means to adopt an ugly, unbecoming garb. The very opposite is the case. Really beautiful and artistic garments must be fashioned in harmony with the natural shape of the body, and particularly that of the waist, which is not round like a pencil, as the

corsetière tries to make it, but of a beautiful oval, and with many soft, undulating curves which the ruthless corset destroys.

The Venus de Milo.

If it be thought that a woman's waist must be small in order to have her clothes fit well, and give her charms and womanly beauty, we reply that the abnormally small waist is not womanly at all. In the Venus de Milo, which is generally acknowledged to be the finest example of classic female proportions, the waist measurement is exactly 47.67 per cent. of the height. This is a trifle more than that of the Chinese woman of to-day. As a matter of fact, a man naturally has a slightly smaller waist than a woman, his liver being smaller in proportion to the rest of the body. Thus the waist measurement of the Apollo Belvedere, generally considered the finest specimen of manly proportions, is only 45 per cent. of his height. Dr. Seaver, of Yale University, measured two thousand young men, and found their average waist measurement 42.7 of their height. So the average American young man has a waist about four per cent. smaller than that of the Venus de Milo. A small waist, then, rightly considered, belongs to men rather than to women, and should not be aspired to by any woman true to her sex. Fig. 83.

Exercise for Corpulence.

It is hardly necessary to add that we would not be understood as arguing for undue fulness at the waist. Corpulence is not desirable either in men or in women. But these excessive layers of adipose tissue are best treated by means of scientific physical culture. General exercise out-of-doors, walking, hill-climbing, cycling in moderation, working in the garden, yes, and housework

done under healthful conditions, will all help to keep the figure free from unnecessary flesh. Many of the English servant girls have waists that would be truly beautiful did they not spoil them by tight, ill-fitting corsets.

Certainly it is the right of every woman to develop by proper training the waist muscles, so that they will give full support to the figure, forming a kind of natural corset infinitely superior to the artificial article. The bust can also be increased in size by breathing exercises and arm movements, some of the best of which will be found in the chapter on physical culture previously referred to.

Suitable Clothing.

Heavy skirts are better not worn, even if suspended from the shoulders. They are cumbersome garments at the best, and do not afford a warmth at all corresponding to their weight and the discomfort of carrying them. Women should wear one or two light woollen combinations, with long sleeves, and reaching down to the ankles. Then a couple of very light skirts will be sufficient, and the body will be clothed equably and gracefully as well. It is a serious mistake to crowd so much warm clothing about the waist and abdomen, and leave the extremities which are farthest from the heart and therefore with a weaker circulation, exposed to the cold.

High-heeled boots with pointed toes are also unhygienic. Boots or shoes for women as well as men should be fitted to the feet, have low heels, reasonably thick soles to keep out the damp, and should be large enough for perfect comfort. A graceful walk is utterly impossible with tight or ill-fitting boots, and much of the discomfort complained of by shop girls and others who are so much on their feet is owing to unhygienic foot-wear.

CHAPTER VI

Personal Hygiene.

The Teeth.

GOOD teeth are not only necessary to good looks; they are very important in the maintenance of health and all-round efficiency.

Poor teeth make thorough mastication difficult, if not impossible; consequently the food is prematurely swallowed, and an extra burden laid on the stomach which may cause it to break down. Moreover, a leading physician of London has pointed out that decayed teeth by causing mouth infection prejudicially affect the general health, and predispose a person to scarlet fever, diphtheria, whooping cough, tonsilitis and other diseases having a local manifestation in the throat.

Possibility of a Toothless Race.

Modern life does not seem to favour the development of good teeth. No one denies that, judged by our organs of mastication, we have degenerated. Indeed it has been suggested that we may look forward to becoming a toothless race if matters do not mend. Only the other day the remark was dropped

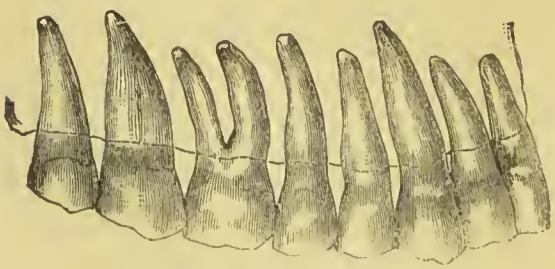


Fig. 83. Healthy Teeth.

in a dentist's office: "I suppose you see a good many poor teeth." The dentist replied, "The trouble is *I don't see any good ones*," and then went on to say that from his opportunities of observation, the day of good, sound teeth had long since passed away, and yearly the condition of things was growing worse.

Causes of Dental Decay.

One primary cause of poor teeth is a failure to use them. Nature abhors useless things; she will not maintain even the teeth for mere show. The general adoption of soft, pulpy foods and the practice of washing down the more solid articles with tea, or coffee, or beer, is responsible for many a poor set of teeth.

Very hot or very cold liquids should be discarded in the interests of the teeth, if not of the stomach. Sweetmeats are injurious in two ways; first, people seldom cleanse the mouth after eating them, and the acids developed from the saccharine matter remaining between and about the teeth are especially injurious to the enamel. Secondly, sweets are productive of digestive disorders, and thus lower the vitality of the whole body, including that of the teeth.

Tobacco Injures the Teeth.

Smoking is another practice which injures the teeth directly and indirectly. Tobacco-smoke helps to coat the teeth with a yellow deposit. It also depletes the vitality, and usually makes a man more careless of his habits in other respects. It is extremely seldom that you will see a confirmed smoker with a good set of teeth.

The large use of flesh foods is conducive to dental decay. The little fibres of meat which are often left between the teeth decompose and form enamel-destroying

acids. Moreover, flesh-eating, when indulged to any excess, causes an impure state of the blood, and interferes with proper nutrition of all the organs, the teeth included.

Alcohol in all forms is destructive to the enamel; vinegar is a condiment which must be discarded by those who would preserve the teeth. There are many drugs, too, which injure the teeth, some of which, like mercury, cause serious damage, and lead to early destruction. Fig. 84.

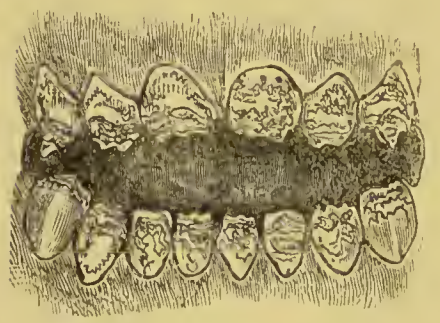


Fig. 84. Teeth injured by mercurial preparations.

In general, plain food, rich in natural salts, with little artificial seasoning, such as brown bread, cereals, vegetables, fruits, etc., are best for the teeth. In slavery times the poor negroes fed on coarsely-ground maizemeal were noted for possessing teeth of pearly whiteness, and the Kaffir of to-day, who lives mainly on "mealies," may be envied for his teeth. If our children had more hard crusts, and no tea, ice-cream, sweetmeats, and cake, their teeth would be far better.

Keep the Teeth Clean.

Few people take proper care to cleanse their teeth. This should be done with a soft brush after each meal, or at the very least every night before going to bed. Floss silk, which can be obtained of any chemist, is very useful in removing food particles that may have lodged between the teeth, and keeping them in a clean, wholesome condition. Once a week a little precipitated chalk should be used to polish the teeth. This may be applied

to parts especially needing polishing by a little piece of wood, slightly softened and teased out at the end, so as to cling to the teeth. The teeth should also be examined by a dentist at least once a year, in order that any cavities may be discovered early, and properly stopped. Waiting till there is actual toothache often means waiting too long.

Toothache.

A word may be said in regard to toothache. The proper cure is to have the offending tooth, if too far gone to be stopped, removed at once. Sometimes the local inflammation is so great that some treatment is required before the tooth can be removed. The application of hot fomentations is usually very effective in such cases. In fact, such fomentations, or dry heat in the form of a bag of heated sand or salt, is altogether the best treatment for toothache, especially when the pain seems to be centred in a sound tooth, or to affect several together. When it is confined to a tooth known to be badly decayed, filling the cavity with cotton wool, moistened slightly with carbolic acid is generally effective. Before applying the acid the mouth should be washed out with warm water, and any food or other foreign matter in the tooth carefully removed. Care should likewise be taken not to let the acid come in contact with the mucous membrane of the mouth. Oil of cloves may also be used.

The Hair.

Baldness at an early age has come to be characteristic of many people of the more highly-civilised nations, the reason being frequently assigned that it is the result of much brain work. This may have something to do

with it; but we believe the chief cause is rather to be sought in an unnatural manner of living, including late hours, and an unwholesome dietary, with sedentary habits.

Why the Hair Falls Out.

It may help to clear up the subject if we consider briefly what falling hair really involves. The hair, like the teeth and the nails, is a growth of the outer or scarf skin. Each hair contains a central canal surrounded by two layers of cells [see Fig. 85], and is inserted in a little pocket, from which it draws its nourishment. Falling hair is usually the result of insufficient nourishment. Thus the hair falls out in typhoid fever because the system is in a run-down condition, and the processes by which the body is nourished and built up are largely at a standstill. All the energies are drawn upon to fight the disease. With returning health comes a return of nourishment, the roots of the hair revive, and a new growth results.

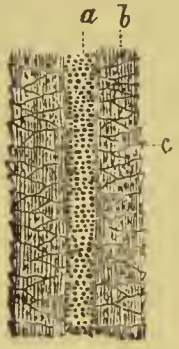


Fig. 85. Hair shaft greatly magnified. *a*. Central cavity; *b*. Epithelial cells; *c*. Outer layer of horny cells.

When the hair begins to fall out in a person who has no specific disease, it is usually because the scalp, at least, has not been properly fed. It therefore resolves itself into a problem of increasing the nourishment of this part of the body. This is done by bringing the blood to the scalp, and incidentally making sure that the blood itself is in good condition, and rich in nourishing qualities. Hence the first thing to do in case of falling hair, is to improve the patient's general health. He should get a proper amount of out-door exercise, should keep early hours, eat plain, wholesome

food, discarding sweets and tit-bits of all sorts, and taking care to chew his food well. He should also avoid too frequent eating. Three meals a day are abundantly sufficient. Deep breathing, practised morning and evening, and the cold morning bath, or a rub down of some sort, are likewise helpful.

Care of the Scalp.

Then the scalp must receive some attention. Cut the hair rather short. The longer each hair, the greater the strain on the roots, and the sooner it will fall out. Cutting the hair close will also allow of thorough cleansing and shampooing, a most important feature of a proper cure.

Cleanse the scalp twice weekly with plenty of soft warm water and any good, mild soap. After carefully rinsing the head in rather cool water, wipe off a portion of the wet with a soft towel, and then rub with the tips of the fingers until the hair is perfectly dry and the scalp red and glowing. If there is some tendency to dryness it may be well at this point to rub in a very little olive oil or pure vaseline. Every morning and evening dip the tips of the fingers repeatedly in cold water, and rub the scalp in the same way till a brisk circulation has been set up in this part of the body. Then brush with a reasonably soft and flexible brush, but not one with bristles set too close together, as such brushes tend to pull the hair out.

Vary the rubbing with the tips of the fingers by pressing firmly on the scalp, and moving it back and forth over the skull. This form of massage will also help to bring the blood to the scalp, and increase the nutrition.

Avoid "Hair-Growers."

Avoid the various, much-advertised hair-growers. As a general rule they are either distinctly harmful or contain some simple ingredients which you could buy direct at less than half the money, and thus save paying the enormous advertising bills of an enterprising company.

Lotions are usually unnecessary except where there is some local disease of the scalp. Dandruff will often give way before the simple treatment already suggested, but equal parts of castor oil and alcohol make a good lotion to rub in after each of the two shampoos taken weekly.

Expose the hair to the fresh air as often as convenient. When walking take off your hat occasionally, and let the wind and the sun have free access to the scalp. Occasional singeing is good for the hair.

Suitable Head-Gear.

Avoid close, tight-fitting hats. A well-ventilated, light felt hat makes a very suitable head covering, and is fortunately coming into favour more and more. Ladies seldom suffer from baldness, one main reason for which is doubtless to be found in the extremely light head-gear they are in the habit of wearing.

The foregoing instructions as to treatment apply especially to men, but with very little modification may be followed by any of the other sex who are troubled in the same way. It is not necessary, of course, to cut the hair short: but the scalp should be thoroughly shampooed once a week, and the hair carefully dried before the fire.

Hair dyes are pernicious things, to be severely tabooed. There is a natural harmony of colouring which

cannot be counterfeited without loss on the score of real beauty. Attempts to alter the colour of the hair have resulted in causing disease of the scalp, and in ultimately destroying a natural growth.

Baths.

Habits of strict personal cleanliness are of the greatest importance in the maintenance of health. Not less than one warm bath weekly, with plenty of soap and the vigorous application of the flesh brush, are required for this purpose. The daily cold bath also helps to keep the skin in a clean, wholesome condition; and should be taken in some form by everyone who would keep himself "fit." A cold bath should never be taken immediately after eating, neither is a very warm bath desirable at such a time. Most people find the early morning hour the best time for the cold bath or douche or the wet-towel rub. The warm or hot bath is taken to advantage in the evening just before retiring.

Malodorous Sweat.

Some persons very cleanly in their habits are troubled with malodorous perspiration. Sometimes the cause is to be found in an inactive condition of the bowels or other eliminating organs, by which an extra burden is thrown on the skin. Of course, such conditions must first be removed. Frequent warm baths

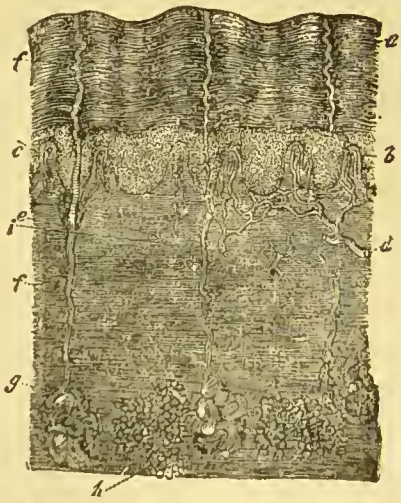


Fig. 86. Section of skin showing three sweat glands.

a. Cellular layer forming false skin; *b*. Papilla; *c*. Small blood-vessels; *d*. Larger blood-vessel; *e*. Fibrous or true skin; *f*. Sweat duct; *g*. Sweat gland; *h*. Fat cells; *i*. Capillary vessel.

with plenty of good soap, and the morning cold bath, together with wholesome habits in general, will then usually bring about a cure. Dusting the armpits with a mixture of borax and talcum powder will be found helpful. Frequent change of underwear is also essential, and care should be taken to clothe the body lightly, giving free access to the air. Too much clothing is extremely favourable to abnormal activity of the sweat glands.

The Nails.

Unclean finger-nails are not only distinctly disagreeable to the eye, and suggestive of bad breeding, but they are full of danger to the individual himself and to others. Numerous colonies of disease germs nestle in the filth to be found under neglected finger nails, and cases of serious infection have been thus caused, though in the vast majority of cases the evil done in this way might very likely be charged to other causes. Warm water and soap, with the industrious use of the nail brush and attention to proper trimming, will usually insure a clean and healthy condition of the nails of both hands and feet. The former, it may be said in passing, should be cut round, the latter should be cut across to avoid painful ingrowing.

The Clothing.

A great deal has been said in favour of woollen underclothing; but for persons in reasonably vigorous health it is coming to be considered that linen mesh garments afford the ideal material to put next to the skin. Such fabrics while they do not have the cold clammy "feel" of closely-woven linen, receive and

throw off quickly all moisture from the body, thus keeping the skin dry and clean, whereas the woollen underwear, by retaining the moisture, encourages a relaxed state of the skin, which largely destroys its natural resistive powers against change of temperature.

Evils of Over-Clothing.

It is not well to over-clothe the body. Heavy coverlets by night, and too much clothing by day are likely to interfere decidedly with an alert, vigorous condition of the body. It does not make for comfort in the long run, for the more the body is coddled, the more sensitive does it become to the cold. Sometimes a process of hardening is an excellent thing. One excellent means of improving the tone of the skin is the air bath. It may be taken conveniently just before retiring. Disrobe completely, and give the whole body a vigorous rubbing with a flesh brush or with the bare hand. Light gymnastics may also be taken during the air bath.

Wet Feet.

While it is wrong to coddle yourself, it is also a bad thing on the other hand to neglect to take proper precautions against undue exposure. Wet feet, for instance, should be attended to at once. It may not do any great harm to get the feet wet while taking a walk or engaging in other exercise; but to sit with wet feet is dangerous. It may cause a severe cold, it may bring on affections of the lungs, or even of the kidneys. Children should be carefully instructed to avoid going with wet feet.

In stormy weather it is safest to use *goloshes;* but they are hardly necessary in a light rain provided one

has taken the trouble to have a strip of cork placed between the inner and the outer sole of the boot. This latter precaution is well worth while since it will enable the feet to be kept warm and dry on wet days when the damp will penetrate even a very thick sole composed only of leather.

Children's Clothing.

Children are often clothed warmly about the trunk, but left with bare legs even in the coldest winter weather. This is most inadvisable, and is probably the cause of catarrhal affections, and sometimes of even graver diseases. In general, the clothing should be distributed evenly over the whole body, with possibly a little extra protection for the chest. Sleeveless vests are on this account not to be recommended, unless in the warmest summer weather.

CHAPTER VII.

Aids to Pure Living.

"My strength is as the strength of ten,
Because my heart is pure."

PURITY of mind and body is one of the first essentials to robust health. The temptations to impurity are so many and so strong, especially in the lives of young men, that a few words of friendly warning and advice will hardly come amiss.

Cultivate Pure Thoughts.

The young man or woman who would live a pure life must first of all cultivate pure thoughts, and that not merely in the negative sense of avoiding impure, sensual imaginings, but in the positive sense of keeping the mind so fully occupied with noble thoughts and purposes that everything else will be crowded out.

Put your whole heart into your work while you are about it, and the moment you are off duty, apply yourself as heartily to wholesome recreation of some sort or to self-improvement. Don't give yourself to idle musing. "An idle brain is the devil's workshop." Daily toil is a blessing from heaven which wonderfully strengthens the character, and helps to build up moral as well as physical muscle.

Regular exercise of some kind is helpful to purity. Especially is this necessary when one's daily employment is of a sedentary nature. The movements given in the chapter on Physical Development will be found suitable

for such. Bodily exercise, by equalising the circulation, relieves congestion of the internal organs, and has a calming effect upon the passions. It also contributes to calm, restful sleep, which is so important to the proper up-building of the body.

Control Appetite.

The adoption of a simple, natural diet is a most powerful aid to pure living. Learn to control appetite, and you will also be master over your passions. Especially harmful to young people of a highly-strung, nervous temperament is the free use of meat, the animal extracts of which tend to inflame the lower passions and rouse the animal nature.

It is hardly necessary to say anything about the value of good associates; if they cannot be had, better be entirely without intimate companionship. A young man should be pure in speech himself, and prompt in rebuking anything of a contrary nature that is spoken in his presence. This requires a high degree of moral courage; but the youth who has no courage had better not call himself a man at all. Not to protest in some way against improper language on the part of one's associates is to acquiesce in it. Language that a young man would not wish to have his sister or mother listen to, is unfit for him to use or to allow unrebuked in his companions.

It is related that General Grant as a young man was present with some comrades, when one of the company started to tell an incident of a questionable character, prefacing it with this remark, "I believe there are no ladies present." Young Grant immediately interrupted with the significant words: "No, but there are *gentlemen* present," and the impure jest remained untold. Would

that every young man of pure mind had the courage to do likewise.

"A White Life for Two."

Let no young man deceive himself into thinking that health requires the indulgence of passion. Chaste living is just as healthy for a man as for a woman, and the law of purity is equally binding on both. "A white life for two" is the standard which God has set, and no one has the authority to alter it. "You talk about the fallen woman," said "Gipsy" Smith in one of his straightforward, manly addresses; but I want to ask, "*What about the fallen man?*" The question is well worth asking. If we look for the fallen man, we shall not find him on the streets, but perchance in some fine drawing-room wooing a pure, innocent young woman upon whose life, now so full of bright promise, he may as likely as not bring hopeless ruin.

Our social code needs to be remodelled. Vice should be known by its right name, whether committed by man or woman. The law of purity should know no sex. No young man has a right to look forward to leading a pure girl to the altar unless he can sufficiently control his passions to keep himself pure. And let it be said here, no man ever sowed wild oats without reaping a harvest in kind. "Be not deceived: God is not mocked: for whatsoever a man soweth, that shall he also reap."

Evils of Secret Vice.

Secret vice, besides consuming the vitality and strength of all the bodily organs, deadens the moral sensibilities, wrecks the brain and nervous system, and completely unmans its victims. Unfortunately the number suffering from the results of secret vice committed, perhaps, in

their early days of ignorance, is so great that a book on general health is hardly complete without some advice in reference to the best means of recovery. As a general rule, these cases are susceptible of cure, *provided the victim takes himself earnestly in hand.* As both the cure and the prevention of the evil are alike largely dependent upon certain health habits which should be generally cultivated, what is said for the benefit of the unfortunate victims may be helpful also to him who has not fallen.

How to Recover Health.

First, do not despair. In all likelihood your case is not so serious as you think it to be.

Do not look to the patent medicine vendor for a cure, nor to the physician who advertises himself in the newspapers. The latter is pretty sure to be something of a charlatan, for competent medical men have patients enough without advertising for them.

Consult a properly qualified physician to learn, as far as possible, what he thinks of your case, and get his advice as to your daily habits; but don't depend upon a course of drug medication for cure.

Give up alcoholic drinks if you take them, and tobacco as well. Avoid strong tea; you will be better off without either it or coffee.

Be of Good Cheer.

Determine to get well; centre all your thoughts on health; eat for health, exercise for health, work for health, sleep for health, live for health. Look on the bright side both of your condition, and of things in general, and associate with bright, cheerful but pure companions. Be terribly in earnest in overcoming

every weakness; but avoid gloom, despondency, remorse. Rejoice in the sunshine, the flowers, the green hills, the invigorating breezes; endeavour to imbibe a love for nature in all her moods. Be out-of-doors as much as possible.

Cultivate, too, a love for the Word of God. Don't read it merely as a duty, but take its precious promises, and use them as aids to help you to elimb higher and higher, and attain to that perfeet health and purity whieh it is the Creator's will that His ereatures should enjoy here below.

Forget the Past.

Absolutely forget all the sins and mistakes of the past. God forgives sin, and He does not want you to earry the burden of it. If you let your mind dwell on the past, you will never be in a eondition to deal with the responsibilities of the present. Remember, every day comes to you absolutely new and fresh. Eaeh morning you turn over a new leaf in the book of your life; on that new page, fair and elean, may be reeorded pure thoughts, noble aspirations, kind, loving words, and deeds that will be remembered only with pleasure. This, then, is your high privilege every day, and you must, if you would be eured of your trouble, seize this opportunity, and use it. You must live the highest life you are eapable of living, looking to God for the help He gives to those who ask Him.

Rules of Hygiene.

Take the daily eold bath in some form. In the coldest winter weather it will probably be best for you to take it as a wet-hand rub, or sponge-bath, always followed by vigorous frietion. In summer the cold spray or plunge is in order.

Sleep on rather a hard bed. Never sleep on feathers; they are emasculating, and unduly heat the body.

Follow a wholesome diet, eating largely dry, hard foods, with some good fruit, and drinking only between meals. Let good brown bread, preferably in the form of zwieback, be your staple article of diet.

Avoid clothing the body too heavily, whether by night or day. Practise deep breathing as explained in the chapter, Physical Development. Be regular in work, and in recreation, and in your sleeping hours. Avoid sleeping late in the morning. Six o'clock is not too early for rising, at any time of the year, and half past five is very proper for summer.

Avoid cheap novels and exciting stories. Don't spend much time even on the newspaper, but take a little time every day to read something excellent. Books of biography, history, and travel are at once interesting and profitable; they broaden the mental horizon, inform the mind, and fit one for greater usefulness.

Finally, do not expect to see immediate results of your efforts to get well. Be patient as well as hopeful, and thoroughly in earnest. Do not worry, no matter what happens. Worry destroys nerve power, and with it the ability to do really good work of any kind.

"A merry heart doeth good like a medicine; but a broken spirit drieth the bones."

CHAPTER VIII.

A Healthy, Comfortable Old Age.

"And he died in a good old age, full of days."

OLD age is generally accompanied by infirmities and various disease conditions. Indeed, so generally is this the case that one is liable to assume that advancing years must necessarily involve a state of weakness and chronic ill-health; yet this would be a serious mistake. The ordinary infirmities of old age are to a large extent the outcome of wrong habits of living.

A Gradual Failing of Strength.

It is quite true that there must be a gradual falling off in physical strength and vigour. As the lusty child daily increases in strength, so by a somewhat slower process the aged grow weaker by the gradual wearing out of the various bodily organs; but this does not necessarily pre-suppose pain and disease.

Death from old age is practically painless — it is the gradual fading away of life's vigour, even as the fully-matured rose fades, and its petals drop quietly to the ground. It is like a weary man going to sleep. The pain and agony that often precede death are due principally to the fact that the dying person is still young and vigorous in part, but some of his organs, owing to over-use or abuse, are hopelessly worn out; hence the struggle.

The Natural Term of Life.

But even the natural death, the death from old age, must come some time. There is a limit to life on this earth. What is that limit? Looking at the lower animals, we find that their natural term of life is fully five times as long as the time required for them to reach maturity. Man does not mature before he is twenty; in fact, most men keep growing till they are twenty-five. Hence, adopting this rule, man's natural term of life should be something over a hundred years.

And if we examine the records, we find a great many who have passed this limit, and a few who have even exceeded a century and a half. Hippocrates, the father of medicine, lived to be 104 years old; St. Anthony lived to 105, and Paul the Hermit to 113.

Pliny's List of Old People.

The elder Pliny made a carefully compiled list of very old people living in his time. It appears that there were then living in that portion of Italy lying between the Apennines and the river Po, 124 men of a hundred years and upwards. In addition to these there were living at Parma three men of 120 and two of 130 years of age, at Facentia a woman of 132, and in another small town ten more persons of equally advanced ages. These figures, Pliny tells us, he secured from the records of the official Roman census and in the light of other researches they are not beyond belief.

Captain Cook on his first visit to New Zealand was astonished at the remarkable health enjoyed by the natives. He found not a single person who appeared to have any disease. The island, he said,

abounded with a great number of old men, many of whom, by the loss of their teeth and hair, appeared to be very ancient, and yet none were decrepit. Although inferior to the young in muscular strength, they did not come behind them in cheerfulness and vivacity.

In England the well-known Thomas Parr attained the superb age of 152, enjoying a good degree of vigour to the last. Dr. Harvey, the distinguished discoverer of the circulation of the blood, on opening his body found the organs in a remarkably good state of preservation. Parr would probably have lasted another twenty or thirty years had he been left to live in peace his simple life on the farm, but the luxurious life and strong wines of the ducal palace proved too much for him.

How to Escape the Infirmities of Age.

It would not be difficult to name many other noted centenarians whose ages have ranged from a hundred to a hundred and fifty years, but it is not necessary. The facts clearly warrant us in assuming that a man's life under favourable conditions may round out a full century or more, and we may pass on to consider what habits should be cultivated in order to escape most of, if not all, the infirmities of advancing years, and retain health and usefulness as long as possible?

Sir William Temple, writing of "Health and Long Life," says: "Essentials amongst primitive people are: Great temperance, open air, easy labour, little care, simplicity of diet, rather fruits and plants than flesh."

We quite agree with him in putting temperance to the front. To attain to a healthy, comfortable, useful old

age, one must cultivate moderation in everything, and most of all in eating and drinking.

Centenarians Temperate in Their Habits.

You will find centenarians differing widely in respect to hours of eating and the number of meals, you will find some teetotalers, and others who are not; but you will not find one over-hearty eater or heavy drinker who has reached the age of one hundred years in a fair condition of health and comfort. No, the one rule that scarcely admits of exception, is that long livers are found to be men and women whose lives have been free from excesses of all kinds.

Moderation has to do with the control of passions as well as of appetite. Anger, malice, envy, bitter feelings, jealousies, all prey upon the body, and tend to drag it downward into the grave. Pleasant, kindly thoughts, and a contented frame of mind are great life lengtheners.

Worry is an enemy of old age. The secret of overcoming the worry habit is to give one's best attention to each duty as it comes, and not let the mind occupy itself either with the mistakes or the possible difficulties to be met in the future. One day at a time must be the motto of the man or woman who would grow old gracefully.

The Simple Life of Centenarians.

A taste for simple things is characteristic of most centenarians. Joyce Heath, of America, who lived to be over 160, when asked what her diet was, replied: "Corn bread and potatoes is what I eat." A Smyrna centenarian of 113 years lived chiefly on bread and figs, his beverages being water and milk. Bread and butter, whey, potatoes and buttermilk, formed the chief food

of hundreds of centenarians whose names have come down to us; whereas rich and complicated foods and luxury in general seem always destined to cut people off before they have filled their days.

It is sometimes urged that as old people are feeble, and their vitality low, they need "keeping up" by means of much meat and wine and other stimulants, but the result of high feeding of this kind is to overload the system with impurities and with an excess of nutrition, thus laying a very heavy burden on the excretory organs, which they are not able to bear. The aged are not growing and building many new cells as children and youth; hence they need comparatively little proteid: neither do they engage much in active physical labour; therefore they should not eat too freely of energy-producing foods such as starches, sugars and fats.

Rather spare feeding, and that of the best food, well-cooked, and tastily served will best suit an aged person. If the teeth are gone, or largely so, the food must be taken soft; but even then we should advise slow eating, and the thorough mixing of the food with the saliva before it is swallowed. The results will be increased enjoyment in eating, and greatly improved powers of digestion.

Diet for the Aged.

Among the foods especially suited to old age, we would mention zwieback (soaked in hot milk); wheat flakes; gluten gruel; good, well-baked, wholesome bread; baked potatoes; rice; dates; grapes; mellow apples; sultanas; steamed raisins or figs; milk; soft-boiled eggs; and some of the best nut foods. In general, any simple, wholesome article of food which seems to

digest well may be given. There is a wide variety of stomachs as well as tastes, and it is not best to be arbitrary in laying down rules; but the requirements of simplicity and wholesomeness should always be satisfied. Tit-bits, rich and greasy foods, pork, sausages, and heavy pastry are unsuitable to the aged. Alcoholic stimulants, as pointed out by Sir Henry Thompson and many others, are decidedly injurious. Even those who have used them for many years derive distinct benefit from cutting off this class of indulgences. Mild, pleasant, natural foods and drinks, such as children like, are usually suitable for the aged.

Luscious fruits may well take the place of wines and spirituous and malt liquors. Grape juice is an excellent cordial for the old, containing a rich solution of valuable salts and natural sugars, which will help to build up the system. Nearly all fruit juices are very good, notably that to be obtained from sweet oranges.

Alcohol Shortens Life.

Not only does alcohol fail really to nourish the system, but it has a most deleterious effect upon the tissues of the body, and likewise more or less seriously upsets the nervous system. Gout, rheumatism, neuralgia, nervous trembling, heart affections, and various forms of paralysis are among the commonest of the evil results of using alcoholic stimulants, and there can be no doubt that all such beverages seriously shorten life as well as interfere with the health of the bodily organs.

Life in the open air is favourable to longevity. Moltke, asked in his 90th year how he maintained health and activity, replied, "By great moderation in all things and by regular outdoor exercise." Sidney Cooper, the cele-

brated landscape painter, who died at an advanced age, was very particular to take a daily walk in the open air.

Rules for Longevity.

Sir James Sawyer lays down the following among other rules for longevity:—

1. Eight hours' sleep.
2. Keep the bed-room window open all night.
3. Do not have the bedstead against the wall.
4. A morning bath at the temperature of the body.
5. Eat little meat, and see that it is well-cooked.
6. Watch the three D's—drinking water, damp, and drains.

We believe that the first and second rules are especially important. It is not well to stint sleep, and fresh air at night is an absolute necessity. Some old people prefer cold to warm bathing; this depends largely upon individual peculiarities. The wet-hand rub or towel rub is found very satisfactory by some.

Sir Benjamin Ward Richardson thought the would-be centenarian should never smoke or drink, should keep early hours, and work as little possible by artificial light.

It was a saying of Dr. Jowett that "to have a great work in progress is the way to live long," and we believe that there is much truth in it. Certainly men who entirely give up work, and settle down to lives of luxurious ease, with practically nothing to live for, do not long remain above ground.

Cause of Childishness.

A great deal of the so-called childishness of old age is probably due simply to disuse of the mental powers.

A person getting pretty well along in years finds his friends assuming that he ought to lay aside most of his active responsibilities, and gradually does so, withdrawing himself into a sort of intellectual sloth which is by no means favourable to health either of mind or body. The brain cells do not naturally deteriorate with the other cells of the body, and if a man continues to use his intellect in a moderate, sensible manner it is reasonably sure to stand him in good stead.

Laziness of the mind is probably far more prevalent than that of the body. Most people need the stimulus of public opinion, coupled with a high sense of duty and responsibility, in order to keep hard at work. With all these stimuli absent in the case of the old, it is not strange that they should settle back into a state of inertia, which is as unsatisfying as it is harmful. Let the old busy themselves with something suited to their age and condition of life: don't insist on their doing nothing. Stagnation is alike dangerous to old and young; Nature hates idleness, and will not omit to punish it swiftly.

Earnest, patient efforts to cultivate the memory and keep the mind active will more than repay the old person by making life so much more pleasant and enjoyable.

History tells of numbers of men who kept their intellectual powers up to the end of a very long and useful life. Even the old need to guard against unduly petting themselves; for petting leads to dotage.

Precautions Against Exposure.

On the other hand, every old person should take some proper precautions against exposure. He must have plenty of warm clothing in cold weather. An aged person's cir-

culation is naturally not so vigorous as in youth or middle age; the fires of life burn less brightly; hence more protection is needed against cold. A somewhat higher temperature in the living-room is also desirable for old people.

Care should be taken not to strain the eyes. Spectacles should be fitted by a physician, and they will need to be changed from time to time.

Colds should never be neglected, as they are likely to lead to chronic catarrh, which in turn may affect the hearing.

Scourges of the Aged.

Exposure when overheated is a frequent cause of pneumonia and bronchitis, which are among the old man's greatest enemies.

Never stand on the street to talk unless the weather is exceedingly warm. When riding or driving, be warmly and equably clad, taking special care not to chill the lungs.

Rubbing a little olive oil into the body after a warm bath, which should be taken not less than once a week, is a good preventive against colds, and also helps to keep the muscles supple.

The feet should be protected from damp. Wet feet have caused thousands of deaths. Socks changed frequently are warmer and more porous.

In general, every person advancing in years, needs to study his own particular needs, both as to clothing, food, and other matters, and while obeying the general laws of health, give heed also to the proper adaptation of them to his own immediate circumstances. Good common sense is an essential qualification to the successful carrying out of any system of living.

CHAPTER IX.

Household Hygiene.

IN the successful carrying out of the principles of household hygiene much depends on having a healthful house to begin with. Some houses are badly located and so poorly constructed as hardly to admit of being put in a thoroughly wholesome condition.

The Ideal House.

The ideal house has an elevated position, a southerly exposure, and (although this is not absolutely necessary) a gravel soil. It should be plentifully supplied with windows, and its ground floor should be protected against damp by two layers of cement with an air space between. Its drains should be in perfect order. The house should not be surrounded by too heavy foliage, though partial protection by trees is desirable. It should be free both within and without from signs of mould or mustiness.

Persons who live in rented houses may not be able always to get what they desire ; but some things must be insisted upon. Damp, musty houses are dangerous, and should not be lived in under any circumstances. It is well to inquire into the history of a house you are about to rent or to buy. Make the inquiry as searching as possible. Some houses have very remarkable histories. The old stories of "haunted houses" had a substratum of fact: such places were not haunted by shadowy ghosts

nor by evil spirits; but they were doubtless infested with millions of germs, with the result that deaths happened with mysterious regularity in the successive families that tenanted them.

Before moving into a house have it thoroughly cleansed from top to bottom, and all the corners cleared out. Then if you are not absolutely satisfied as to its history, seal up the windows and all cracks and openings, and fumigate the whole house thoroughly by burning a few pounds of sulphur in an iron kettle in each room. This may cause a little trouble, but it is the safe thing to do, and will in the long run save time and perhaps precious human lives.

House Furnishing.

Take health into consideration in furnishing your home. In the first place, never overdo the matter of furnishing. Some living-rooms look as if they might be second-hand shops, so abundantly are they stocked with bric-a-brac and pictures of all sorts, and odd pieces of furniture. We may learn a lesson here from the Japanese, whose rooms look bare at first to an Englishman, but on second consideration are seen to possess a restfulness and a fine artistic effect entirely wanting in some of our over-furnished apartments.

Spencer has well said that to fill a room with beautiful things is not necessarily to make it beautiful. Many rooms would be far more inviting and wholesome if cleared of fully half the bric-a-brac that they now contain. Why not let the wall paper be seen here and there? And why spoil the effect of a pretty mantle by loading it with such a wealth of—shall we say rubbish? Such things all gather dust and germs, and give the housewife or servant a great deal of extra trouble to keep clean.

House Cleaning.

This brings us to a consideration of sweeping and dusting. As often performed, these necessary household operations result in doing more harm than good. The dust which has been reposing quietly, we will suppose, under the bed or table, is whisked up into the air, and although some of it is gathered into the dust-pan, a considerable portion settles down again later. Dusting with the old feather duster, which fortunately is going out of style, is an effective method of germ distribution. Dust should always be removed with a very slightly dampened cloth, and the fewer the articles to dust the better. The air is always purer in a room lightly and airily furnished than in one loaded with the usual bric-a-brac.

Stuffed furniture is unfortunate from a sanitary standpoint. It is bound to gather up germs and dust, and it can never be properly cleaned. Carpets are also unhygienic, linoleum or oilcloth with a sprinkling of light rugs being far superior. The polished floor is ideal.

Bed-Room Hygiene.

The most important thing in a bed-room is the window —keep it open day and night. Bed-rooms ought also to have the sun for a part of the day at least. Close-smelling bed-rooms are a menace to health. The room in which we spend one-third of our lives is by no means to be relegated to a position of minor importance. Consumption still causes about one-seventh of the deaths the world over, and one of the chief causes of consumption is the breathing of foul air. It is not safe to think that the air in a bed-room is satisfactory because its foulness is not apparent. A good way to test the matter

is to dress some morning, and go out into the fresh air, closing the bed-room door behind you. On returning from a brisk walk, go straight to the bed-room, and sample the air. If there is any considerable contrast between the atmosphere outside and in the bed-room, the ventilation is deficient.

Ventilation.

People who are sensitive to draughts or even a cold air breeze often object to ordinary window ventilation. There is a very simple device which readily overcomes this difficulty. It consists of a plain triangular box, which is fastened to the upper part of the window so as to direct the air to the ceiling. Fig. 87. Here it is warmed, and then diffused downward. The box is fitted to remain permanently, and can be attached to any window. The upper sash may be lowered from one to ten or twelve inches according to the size of the box and the state of the weather. The expense of installing the box ought not to be much, and it can be securely and neatly fitted by any good carpenter.

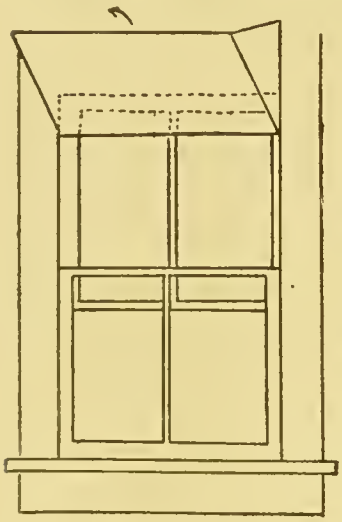


Fig. 87. Triangular Ventilating Box.

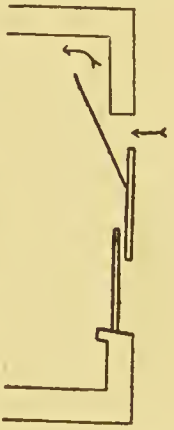


Fig. 88. An End View.

The Bed.

Next to an open window, a good bed is very essential. The wire mattress with overlay is by far the most satis-

factory, and if to this we add a cotton pillow and a proper number of light woollen blankets, we have the ideal place for a good night's rest. Feathers are not desirable; they absorb and hold emanations from the skin, odours of all kinds, and animal impurities, and are a prolific cause of overheating, sleeplessness and discomfort. Overlays and bedding should be given a thorough airing in the sun occasionally.

Kitchen Hygiene.

The hygiene of the kitchen and scullery is a matter of some importance. These comparatively out-of-the-way places should be kept, if anything, more scrupulously clean than any other part of the house. They are the chemical laboratories where the food is prepared, and where the clothing is subjected to the weekly cleansing process. These operations are of vital importance in the hygiene of a home, and too much pains cannot be given to insuring their being carried forward on thoroughly clean premises.

The condition of the front doorstep, upon which a good deal of labour is usually expended, is of very slight importance compared with the need of a clean, sweet, airy, well-lighted and orderly kitchen.

Importance of Strict Cleanliness.

Dish-washing is a household rite often performed very unsatisfactorily. Knives, forks, spoons, and dishes, it is well to remember, are not merely to be cleansed from the particles of food that may adhere to them; but they are to be freed from all traces of contact with mouths perhaps containing decaying teeth, or otherwise in an unhealthy condition. Many consumptives, for instance, go at large, often not aware them-

selves that they have the disease. Yet the deadly consumptive germ is likely to infect forks and spoons which have been in such a person's mouth. In view of these facts, it is passing strange that dish-washing should be done in such a slip-shod manner even in very good homes. Dishes should first be washed in warm water in which a little soap has been dissolved, and then rinsed with boiling hot water, after which they should be dried with towels kept sweet and clean by frequent washing. Dish-cloths also should be kept in a clean, wholesome condition, and frequently hung out in the sun to air.

A general principle to follow in all household procedures is that of strict cleanliness. Disease lurks in dark corners, in masses of old papers, rags, and rubbish, in filthy door-mats, in old dusty carpets, and everything of like nature. Keep every nook and corner of the house clean, and observe cleanliness in all household operations, and you have gone a long way on the road to a healthy home.

The Care of a Sick-Room.

All that has been said in the foregoing pages concerning cleanliness, ventilation, and sunlight applies in a double sense to the sick-room. Whichever part of the house is devoted for the time being to the use of the sick member, let it not be a dark, dismal bed-room, with no proper facilities for ministering to the comfort and happiness of the invalid. Let it rather be one of the brightest, cheeriest rooms in the house, open to the sunshine and heaven's invigorating breezes, somewhat aloof from the living-rooms to secure the greater quiet, and if possible with a pleasant outlook. These condi-

tions cannot always be attained, but they should be approximated as nearly as possible.

Furniture of the Sick-Room.

Let the furniture of the sick-room be composed of articles which afford no protection for germs, and which may be easily disinfected. A few bright but not garish pictures may hang on the wall — pleasing landscape paintings or etchings are usually grateful, but the patient's taste may suggest other subjects. Anything of a quiet, restful character is to be preferred. Cheap bric-a-brac is best banished absolutely, though a simple vase for fresh flowers, to be frequently changed, should invariably form part of the furniture of the sick-room, and if the patient desires them, two or three healthy plants will do no harm.

While good ventilation is very important, care should be taken to avoid draughts. If the bed is near the window, its position can be changed, or some device arranged for breaking the current of fresh air, and diffusing it evenly to all parts of the room. It is also well to guard against too strong light, especially if the patient's eyes are weak; but the room should be accessible to the healing rays of the sun.

The Nurse.

Quietness and ease should mark every movement of the nurse or attendant in the sick-room, and kindliness, good cheer, and loving sympathy should be manifest in every word and look. On the other hand, good-natured firmness should be observed in carrying out the instructions of the physician in charge. Great pains should be taken to keep the room absolutely clean, not only for

the sake of maintaining a pure, germ-free atmosphere, but because a clean, orderly room will also have a restful effect on the patient. Of course, the cleaning of the room should never be done in an obtrusive manner. The patient must not be disturbed in any way. The nurse herself should be tastily dressed in the cleanest of gowns, and should be dainty and tidy in all her habits.

Medicine bottles, and any treatment cloths, etc., should be kept out of sight. Food should be taken from the room immediately the patient has finished eating. Everything that would befoul the atmosphere should be removed without delay, and the room kept sweet and clean at all times.

Before the sick-room is used again for ordinary purposes, it should be thoroughly disinfected according to the instructions of the physician in charge.

CHAPTER X.

The Food Problem.

THE questions, "What shall we eat? and what shall we drink? and wherewithal shall we be clothed?" are as practical to-day as they were two thousand years ago.

The first one is, perhaps, the most difficult of the three to solve. Eating is a prime necessity of life. The old fable is only too true: All the members of the body must work for the belly, but it in turn nourishes the whole body, and so justifies the care which it imposes.

Diet Reform.

The food problem has come in for considerable discussion of late, partly as a result, no doubt, of the increase of various forms of dyspepsia, causing earnest inquiry on the part of persons thus afflicted as to the most nourishing and easily digested diet; and partly as a result of the growth of humanitarian sentiment, leading to the avoidance on the part of many of all forms of food involving slaughter of the lower animals. No doubt the spread of the general principles of hygiene and temperance, the interest in athletics, and the demand for more economical foods for the labouring classes, are other influences which have been active in bringing diet reform to the front. At any rate people are awaking to the importance of the matter, and many are making radical

reforms, both as regards the selection and the preparation of their food.

The opinion which once prevailed, that flesh meats were *par excellence* the strength-giving foods, is now seen in many quarters to be fallacious, and while the number of out-and-out vegetarians in this country is not large, there is a very numerous class composed of those who are more or less in sympathy with the movement, and who find their health better and their strength amply maintained on a diet consisting almost exclusively of the fruits of the earth.

New Ideas about Diet.

This book may not unlikely fall into the hands of many who are experimenting with the new ideas advanced. Some of our readers, again, may have given the subject very little thought. They have enjoyed a fair degree of health on the diet which has come to be customary in this country, and have not felt the need of a change. Nevertheless, with the increased pressure of living which is a marked feature of twentieth-century civilisation, new demands are made upon men's energies and it is inevitable that increased attention should be given to the securing of new supplies from the best sources. Just as the demand for rapid trans-Atlantic travel has made the question of the best coal one of lively importance, so the present day demand for rapid and efficient work under high pressure must inevitably lead to a scientific study of the question of our daily food.

Eating for Strength.

We recommend thorough study of the whole matter, both with a view of the underlying principles involved and the reader's opportunities of carrying them out. It

is not well to form hasty conclusions; they are liable to be incorrect ones. Let us give the matter of our daily diet the candid, thoughtful consideration it deserves. It surely cannot be denied that the food eaten at the dinner table goes to form the fabric of our bodies, and if athletes curb their appetites and limit themselves to plain fare while undergoing training for feats of various kinds, much more should men and women who have real work to do in the world eat and drink with a view of getting from their food the maximum of strength and nerve energy with which to perform their daily tasks.

There are a number of questions embraced under the general head of diet, such as the selection of the food, its proper preparation, the amount that is required daily for the maintenance of the body, the most wholesome and satisfying combinations of foods, the time and manner of eating, etc.

A Classification of Foods.

We shall confine ourselves in the present chapter to the selection of the bill of fare. Perhaps a brief classification of foods, considered with reference to their chief elements, will be first in order. Roughly speaking, the foods used by the human family contain the following nutritive elements, each of which is important in the maintenance of a well-nourished body:—

Starches.

Sugars.

Fats.

Proteids.

Mineral salts.

The starches and sugars supply energy and heat to the body. Fats also serve this purpose, and are stored up in the form of adipose tissue to be called into use in

an emergency. The proteid element serves the exceedingly important purpose of building up the broken-down tissue, while the mineral salts assist in the operation, and also supply to a certain extent the building element, as in the case of the bony tissue.

Starches and Sugars.

Starches are required in the largest quantity, and fortunately they are also the least expensive form of food. Rice, wheat, and, in fact, all cereals, are rich in starch. Potatoes, turnips, carrots, and most vegetables contain a considerable proportion of this element, though being so watery and likewise having considerable woody matter of a non-nutritious character, called cellulose, their nourishing value is not very large.

Sugars are of various kinds. The artificial variety, made from cane or beets, is not the most wholesome form of food; taken in any considerable quantities it is pretty sure to cause digestive disturbances, while a few stomachs cannot bear it at all. Fruit sugars, on the other hand, such as one finds in grapes, figs, dates, raisins, bananas, etc., are grateful to the appetite, in a high degree sustaining, and easy for the digestive organs to deal with. In fact they are quickly absorbed into the blood without requiring to be changed by the digestive juices.

Ordinary starch is, in the process of digestion, changed into the natural sugar before being absorbed. The prolonged baking or roasting of cereals changes a part of the starch they contain into dextrin, which is a variety of sugar closely resembling that found in sweet fruit.

Proteid Foods.

Proteid is the most important of all the food elements since it enters immediately into the construction of the

living cells of which the body is composed. This substance alone can maintain life, which is not true of any other food element. Proteid is found in the largest proportions in certain animal and vegetable foods. The white of an egg is almost pure proteid aside from the water it contains. Lean meat is also rich in this element, and so are peas, beans, and lentils, nuts of all kinds except chestnuts, and such dairy products as milk and cheese. Cereals contain a fair amount of proteid, wheat being richest in this element. Among the common fruits, bananas, dates, and figs are most notable as proteid supplyers, but the percentage is very small.

The fatty element is represented by dairy butter and other animal fats, nuts, (notably walnuts and pine kernels), and by one fruit, namely, the olive.

So much for the food elements. We have now to consider the practical question: From which foods can we obtain in the best form and at the most reasonable price the food elements of various kinds required for maintaining the body?

Sources of Starchy Foods.

Where shall we get our starches? The answer is quite unanimous that they must come from the cereals, and as about three-fourths of our entire requirements in the way of food consist of starches, it becomes evident at once that the normal diet of the human family must for the greater part at least come from the vegetable kingdom.

Bread has been aptly called the staff of life. Good bread made from the whole wheat kernel contains the different elements we have mentioned in almost perfect proportions. It is deficient in proteids and fats, the

latter fault being made good by spreading on a little butter, or by eating nuts with the bread, and thus supplying both proteid and fats. Rice, which forms the staple food of more than one-fourth the population of the globe, is an excellent source of starch; so also is the potato, the starch of which has been found to be quite easy of digestion. Sugars abound most in the delicious fruits, as well as in malt preparations of various kinds. Dates, figs, sultanas, and raisins, fresh and dried bananas, sweet prunes, oranges, peaches, pears, strawberries, apples, plums, cherries, grapes, and many other such fruits are rich in natural sugars, and therefore may form valuable items in the daily bill of fare. Dates may be had at very reasonable prices and make a staying food. The Arab will do a hard day's work on a lump of dates. Sultanas slowly simmered, or steamed till tender, form a valuable addition to the morning or evening meal. Stewed prunes, and stewed or steamed figs, are likewise nourishing, and exert a gently stimulating effect upon the bowels.

Twice-Baked Bread.

Zwieback (consisting of bread cut in slices and thoroughly baked a second time till crisp throughout) is more readily assimilable than ordinary bread because its starch has been changed into dextrin by the double baking. It is therefore a valuable article of diet, being acceptable to many persons who cannot easily digest ordinary bread. Toasted Wheat Flakes which are extremely thin, allow of even more perfect transformation of the starch into dextrin, and make an excellent food for invalids and persons of weak digestion. Of starches and sugars, then, it is evident we have an ample supply and that from ideal sources.

Proteids or Tissue Builders.

Where shall we obtain the all-important proteids? This is a much mooted question. We shall endeavour to place the facts before our reader, and will then let him decide for himself.

Taking the ordinary diet as an example, one hardly needs to say that flesh meats are largely depended upon for this food element. But that meat is a far from blameless article of food, no one will deny. There are several objections to the use of flesh as a source of food.

Objections to Flesh Food.

First, the animal creation is subject to an increasing number of diseases, some of which are communicable to man. Not long since, according to a local press report, one of two men engaged in slaughtering a cow suffering from anthrax took the disease and died very quickly. Nevertheless, a portion of the carcase of the diseased animal was actually put on sale along with other meat and, but for the interference of an inspecting officer, would doubtless have found a customer and a final resting place in somebody's stomach. Somewhat similar occurrences are by no means rare, and they tend to make people suspicious of the meat trade.

Secondly, the very process of fattening animals for the market is one which, if not bringing on all the outward symptoms and well defined tissue changes characteristic of certain diseases, cannot but create a gross, repleted, and semi-diseased state of the system. Animals freely fed and kept in confinement put on flesh quickly, but it is not healthy flesh. Firm, healthy muscle which comes of temperate feeding and open-air

exercise, makes but tough meat. The public want their meat tender. Hence the fattening process with its necessary accompaniment of disease.

Thirdly, the flesh even of the perfectly healthy animal is necessarily charged with tissue wastes of a poisonous and stimulating character, as will appear when we consider the essential structure of all animals. Every animal is a collection of living cells, each of which has a life all its own. These cells breathe, they take nourishment, reproduce themselves, and as a result of their activities, are continually throwing off effete matter, which in its turn is carried out of the body by that excellent sewerage system consisting of the lungs, skin, kidneys and other excretory organs. While the animal is alive, this apparatus is in active working order; the poisonous waste matters thrown off by the cells are promptly hurried out of the system, and thus the sanitation of the body corporate is insured.

Excretory Wastes of Flesh.

But when the animal is slaughtered, the living sewerage system suddenly breaks down. The various excretory organs cease their work, and the blood, which was the great circulatory medium, no longer courses through the veins and arteries, cleansing and renovating all parts. Meanwhile the individual cells have not all died. They continue to live for hours, possibly in some cases for a day or two, and as long as they live they are actively at work throwing off various impurities. In fact, they live until they are poisoned by the accumulation of their own wastes; then they die and in course of time are taken into the human system for food, along with the excrementitious waste matter in which they are literally

smothered. It must be admitted that this view of the meat question is not a pleasing one; but we are only telling plain facts which can be easily verified by consulting any work dealing with the life and activity of animal cells.

Beef-Tea and Meat Extracts.

It may be further stated that the characteristic flavours of meat, and especially of meat extracts and beef-tea, are largely supplied by these very products of cell activity of which we have been speaking.

An eminent professor in London University, referring in a recent lecture before the American Chemical Society to the claims made for such extracts, remarked: "Instead of an ox in a teacup, the ox's urine in a teacup would be much nearer the fact, for the meat extracts consist largely of products on the way to urea which much more nearly resemble in constitution the urine than they do the flesh of an ox."

Viewed from a health standpoint the foregoing are some of the chief reasons for abstaining from the use of meat. For it is well known that in the human body the excretory organs have sufficient work to do in removing the tissue poisons resulting from the activities of the body's own cells. If then the poisonous wastes of another animal are taken into the system, there is danger of a breakdown on the part of these organs. This is what actually happens in Bright's disease of the kidneys and some other maladies growing out of unnatural and sedentary habits coupled with high living.

Uric Acid in Relation to Disease.

Dr. Haig, who has given special study to the subject of the effect of these tissue poisons upon the human

system, believes them to be directly causative of such common and painful diseases as gout, rheumatism, neuralgia, migraine, and a number of other maladies more or less closely related. Indeed, a full list of the diseases which are believed by excellent authorities to be due either directly or indirectly to uric acid (a general term applied to these waste substances) in the blood would include nearly all the common diseases of a non-infectious character.

Following is a partial list of such diseases and symptoms according to Dr. J. H. Kellogg :—

Gout.

Rheumatism.

Headache, epilepsy, convulsions, hysteria, neurasthenia, nervousness.

Mental depression, excitement, mania, certain forms of insanity.

Bodily depression, fatigue, lethargy.

Vertigo, syncope, insomnia.

Periodic paralysis, chronic paralysis.

Asthma.

Congestion of the liver, diabetes.

Bright's disease, albuminuria, dead hands, cerebral hemorrhage, cramps, dropsy, uræmia.

Gravel and calculus.

Neuritis.

Gastralgia, gastritis, dilated stomach, gastric ulcer.

Jaundice, cirrhosis of the liver, and liver abscess.

Economical Advantages of a Vegetarian Diet.

There is still another objection to flesh foods which is entitled to considerable weight, and that is their expensiveness as compared with vegetable foods of even larger

nutritive powers. It has been said that peas, beans, and lentils are rich in proteids. The following table gives their nutritive value, and also that of the principal flesh foods :—

	Water per cent.	Albumen per cent.	Starch per cent.	Free Fats per cent.	Salts per cent.	Total Nutriment per cent.
Small Haricots	15.0	26.9	48.8	3.0	3.5	82.2
Peas	10.8	24.1	61.5	1.1	2.5	89.2
Butter Beans	9.0	21.9	60.6	1.6	2.9	87.0
Lentils	12.3	25.9	53.0	1.9	3.0	83.8
Lean Beef	72.0	19.3		3.6	5.1	28.0
Lean Mutton	72.0	18.3		4.9	4.8	28.0
Poultry	74.0	21.0		3.8	1.2	26.0
Fish (White)	78.0	18.1		2.9	1.0	22.0

Beef v. Lentils.

It will be seen by a careful examination of these figures that the actual nutritive value of meat is rather small. When one further takes into consideration the fact that fairly good meat cannot be had under 9d. per lb., while lentils can be had in excellent quality for one-third that sum, it becomes evident to anyone that to get our proteids through the use of flesh foods will cost us about nine times as much as to get them through the vegetable kingdom. This is asking much when one recalls the danger on the score of disease and waste tissue to which flesh eaters are exposed.

It may be suggested that peas, beans, and lentils do not agree with some persons. In most cases of this kind the difficulty lies in the pulses not being properly prepared, a matter which will receive attention in our recipe department. Even if pulses had to be dispensed with, however, there still remain some excellent sources of the proteid element.

Dairy Products.

Eggs are very rich in this important tissue-building material, and while not in every respect the most ideal food, they are, when fresh, entirely free from the poisonous tissue products invariably present in meat. Milk is a proteid food which, although often considered a luxury, is really about as cheap as meat, i.e., the same amount of actual nourishment may be obtained from a shilling's worth of milk as from a shilling's worth of meat. It is only fair to say that milk, as often supplied, is by no means a pure food. Colouring matters are frequently used, the public apparently demanding a rich yellow colour no matter how produced, and the leavings at the bottom of the pail are occasionally reminiscent of the stable. But there are dairymen who are particular, and their efforts to supply a pure, unadulterated article should meet with loyal patronage. It is never best to take anything for granted. Find out to your own satisfaction, best by a personal visit, where your milk comes from and how it is handled.

Objections to Cheese.

Cheese is a food rich in proteids; but unfortunately it cannot be recommended. The process of cheese-making is one involving decay, and most varieties when sold are literally reeking with germs. Of course, such unedible abominations as Limburger and Gorgonzola are entirely out of the question. But almost all forms of cheese are milk in a state of decomposition, and the man who would keep his stomach in a clean, wholesome condition and his blood pure, does well to avoid such foods. We give in our recipe department instructions for making curd cheese which is perfectly wholesome.

Nuts are excellent forms of proteid food, and with very thorough chewing will be found to agree with most stomachs. Those who have poor teeth can take them in the form of nut butters and other prepared foods of which there are a number on the market. The food value and nourishing qualities of nuts are dealt with in a separate chapter; hence it will not be necessary to refer to them further in this connection.

The Food Value of Cereals.

Cereals are also fairly well supplied with the proteid element. The man who buys a shilling's worth of bread not only gets a very abundant supply of the starchy element, but gets in addition as much as or more proteid matter than he would get in a shilling's worth of meat. Brown bread contains proportionately a little more proteid than white, the layer of proteid in the grain lying close to the husk. Wholemeal bread, where not too coarse, so as to cause digestive irritation, is by far the most suitable for the daily diet, and a person who makes such bread a prominent feature of every meal, does not require a large amount of proteid in other forms.

Another food especially rich in proteid is gluten, prepared from wheat flour by washing away a large portion of the starch.

The Best Sources of Fats.

The system does not require a large amount of fats; but it cannot thrive without a certain proportion. Neglecting to give children a proper amount of fat may cause rickets. Adults whose diet is deficient in this particular are often troubled with constipation, and with a lack of that feeling of energy and well-

being which a nourishing, properly balanced diet is wont to confer. The excessive use of fatty foods on the other hand leads to biliousness, and other disorders of the organs of nutrition.

An inventory of the available fatty foods of the better class would include cows' butter, cream, nuts, nut butters of various kinds and other nut products, including nut oils; also olive oil and ripe olives. The latter is a form of food which has been popular in Greece and some other Mediterranean countries from time out of mind; it has recently come into favour in America, and is now being introduced in this country.

Composition of Nuts.

Nuts are worthy of much greater consideration than they have received as a regular part of the daily diet. They have a high nutritive value, as will appear from the following general statement of their composition given by Dr. Robert Hutchison:—

Water....	4 to 5 per cent.
Proteid	15 to 20 " "
Fat	50 to 60 " "
Carbohydrates	9 to 12 " "
Cellulose	3 to 5 " "
Mineral matter	1 " "

The chief objection to nuts is that they are rather expensive, some of the best varieties and those most suited to general use, being beyond the reach of many. This, however, is partly due to the fact that nut culture has not been at all extensively carried on, owing no doubt to the fact that the demand has been limited, the public looking on nuts as dainty luxuries to be

eaten between meals or after a full meal, or only in holiday times, instead of as a staple food of great sustaining powers, and containing large percentages of two most important elements in the diet, fats and proteids. It is to be hoped that with a wider use of these important foods the supply will be increased, and the price proportionately lowered.

Nuts Require Mastication.

One valuable feature of nuts is that they require chewing. Soft, sloppy foods are becoming so general that there is danger of civilised nations losing their teeth through never really using them. Doing away with harmful sweets in the family, and giving the children plenty of nuts to eat (always at meal times, however) would do something to increase the health and vitality of the rising generation.

It may be said in passing that insufficient mastication is nearly always the cause of nuts disagreeing with people. Mastication in its proper sense is almost an unknown art amongst us; but nuts are of all foods the ones most likely to help to bring it into vogue again. "Sweet as a nut" is an old comparison which expresses a generally acknowledged truth.

Olive and Nut Oil.

Olive oil is employed in a variety of ways in Italy, and in the Orient, but in this country is confined to salads. Where it can be obtained pure, it affords a very useful part of the dietary. Nut oils are perhaps equally good. Most people will probably prefer nuts and olives in their natural state if able to chew them.

Objections to Cows' Butter.

Cows' butter is a useful fat, and where it can be obtained of good quality and free from adulteration, it may serve the purpose very satisfactorily. Nevertheless, even pure cows' butter is open to some objections. It is not a germ-free food, but on the contrary its various flavours, like those of cheese, are developed by germ growths. To be free from this objection butter should be made from sterilised cream. Cows' butter does not keep well in the summer, and may at all times of the year be discarded, with advantage on the score of purity and wholesomeness, in favour of nuts and nut products.

Cream Easy of Digestion.

Cream is an emulsified fat and, as such, easier of digestion than butter. Devonshire cream is a dainty and wholesome form of fat and one which usually agrees with the digestion. Cream that is kept by means of a preservative is open to objection. Thorough cleanliness in handling and proper cooling ought to enable milk and cream to keep sweet for at least thirty-six hours at any time of the year, and thus render entirely unnecessary the use of various pernicious preservatives. There is room for very great improvement in the public milk supply, and until this improvement is effected, dairy products will be regarded with suspicion by discerning people who are not particularly anxious to make sure of swallowing the proverbial peck of dirt. It is safe to say that if the milk-using public could get an inside glimpse of the dairy business, the demand for milk would suddenly drop far below normal. Recent serious outbreaks of sore throat, fever, and other

diseases, the active causative factor of which has been definitely traced to pus-containing milk, have demonstrated the need of a thorough-going investigation into one of the most important of the country's food sources.

Artificial Butter.

Margarine has come into some favour with the working classes of late because of its cheapness. We object to it as an artificial food of doubtful composition. Some of the ingredients may be entirely wholesome, others are very likely of questionable character. In general, close imitations are not likely to make good foods. Better far to adopt cocoanut butter, which is a pure product of cocoanuts, possessing fully as delicate a flavour as most cows' butter, as well as being less expensive.

Lard.

Lard has attained an undeserved popularity. It is obtained in the first place from an animal which is a notorious scavenger, and often subject to disease. From a digestive standpoint, lard has nothing to commend it, being particularly difficult of digestion. The flaky pastry which is made with it has produced a multitude of dyspeptics, its use in the frying-pan fills the house with unpleasant odours and makes the food cooked in it thoroughly indigestible. Lard may be dropped out of the kitchen supplies without any real loss, and with definite gain to the health. Dripping has been highly recommended as a food, but taken on bread it is less digestible than nut or dairy butter, and such a fat as cocoanut butter would serve all necessary purposes admirably while being free from the animal impurities that the dripping might contain.

Mineral Salts.

We come now to consider the part of bodily nutrition which is supplied by the mineral salts in our foods.

The salts, including principally combinations of soda and potash, also some lime salts, are found in all foods —cereals, fruits, vegetables, and animal products. They act a useful part in nutrition, their presence aiding in the building up of broken-down, worn-out tissue. Vegetables and fruits, while not containing large amounts of nourishment, are believed to be especially valuable for the salts they contain. Scurvy, it is well known, is a disease likely to attack sailors who are deprived for a time of fresh fruit and vegetables.

As the valuable properties of fruit are considered in another chapter, it will not be necessary to refer to them further in this connection. Garden vegetables furnish a very considerable part of our diet, and we may well give them careful consideration. They are, as already mentioned, rich in important salts. They contain in addition varying amounts of starch, a slight trace of the proteid element, and otherwise consist of water and woody matter or cellulose.

The following table gives the chemical composition of some of the most important garden vegetables :—

Composition of Roots and Tubers.

	Water.	Proteid.	Carbo-hydr's.	Fats.	Fibres.	Ash.	Extrac-tives.
Potatoes	76.7	1.2	19.1	0.1	0.6	0.9	1.4
Carrots	85.7	0.5	10.1	0.3	1.5	0.9	1.0
Turnips	90.3	0.9	5.0	0.15	1.8	0.8	1.1
Beetroots	83.9	0.5	11.0	0.1	3.0	0.9	1.0
Parsnips	80.1	1.4	14.1	1.0	2.1	1.3	
Onions	89.1	1.6	6.3	0.3	2.0	0.6	
Sweet Potatoes	72.9	1.6	22.5	0.5	1.8	0.7	

Composition of Green Vegetables.

	Water.	Nitrogenous Matter.	Fat.	Carbohydrates.	Mineral Matter.	Cellulose.	Fuel Value per lb. * Calories
Cabbage	89.6	1.8	0.4	5.8	1.3	1.1	165
Cauliflower	90.7	2.2	0.4	4.7	0.8	1.2	175
Sea-kale	93.3	1.4		3.8	0.6	0.9	
Spinach	90.6	2.5	0.5	3.8	1.7	0.9	120
Vegetable Marrow	94.8	.06	0.2	2.6	0.5	1.3	
Brussels Sprouts	93.7	1.5	0.1	3.4	1.3		95
Tomatoes	91.9	1.3	0.2	5.0	0.7	1.1	105
Greens	82.9	3.8	0.9	8.9	3.5		275
Lettuce	94.1	1.4	0.4	2.6	1.0	0.5	105
Leeks	91.8	1.2	0.5	5.8	0.7		150
Celery	93.4	1.4	0.1	3.3	0.9	0.8	85
Turnip Cabbage	87.1	2.6	0.2	7.1	1.5	1.3	145
Asparagus	91.7	2.2	0.2	2.9	0.9	2.1	110
Savoys	87.0	3.3	0.7	6.0	1.6	1.2	

The potato is one of the most valuable of our vegetables both for nourishing qualities and digestibility. It is best baked or steamed; this is true of nearly all the vegetables, which in these forms of cooking retain their own peculiar flavours and salts more fully than when boiled. Frying is an unwholesome mode of cooking vegetables because it coats a certain portion of the starch granules with grease, and thus hinders the digestive juices from getting in contact with them; digestion is consequently delayed, and fermentation may very likely occur.

The Use of Vegetables.

Vegetables, if used in too large quantities, overload the stomach, and are a great strain upon the digestive juices, their starch yielding but slowly to the action

*[A Calorie represents the amount of energy in the form of heat required to raise one pound of water four degrees Fahr., and is a convenient way of indicating the total nutritive value of a food. The figures in the right column indicate accordingly the total amount of force that a pound of the various articles mentioned could afford to the body. For purposes of comparison it may be remarked that a pound of wheat flour contains 1,675 Calories.]

of the various ferments. Persons who live sedentary lives, engaged mainly in brain work, do well to avoid the large use of vegetables. They can obtain starchy food in smaller bulk and more digestible form in the cereals, and can obtain mineral salts from fruits. Vegetables are better suited to the man who works with his muscles than to him who uses his brain, the energy they require for digestion being out of proportion to the amount of nourishment they afford. Vegetables do not combine well with fruit; hence for persons with weak digestive powers it is as well to forego fruit at the meal in which they are largely taken. Many varieties at a single meal are unnecessary in any case, and are conducive of digestive disorders.

Cabbages and Greens.

Cabbages and onions are somewhat coarse forms of vegetables, the former containing only a very small percentage of nourishment, and the latter containing an irritating oil. Prolonged boiling removes the oil, but even then the nutritive value of the root is too small to make it worth considering as a staple food. Green stuffs like spinach, lettuce and watercress are, of course, not nourishing to any appreciable extent, but may be useful as relishes.

In the foregoing pages we have briefly covered the leading questions arising in connection with the selection of a wholesome dietary. We have found that all the nutritional needs of the system can be supplied by a diet composed only of the fruits of the earth, and that these afford abundant and wholesome variety, suited to the needs of persons placed under most diverse circumstances.

CHAPTER XI.

Underlying Principles of Healthful Cookery.

HAVING surveyed the extensive field from which to select a natural diet, we next inquire into the best modes of preparing food for the table. Let us first ask, What is the object of cookery?

The chief object of cooking food is to render it more digestible. Increased palatability usually follows naturally, but is not the primary object of cooking. Man eats to sustain life—not merely to gratify a few square inches of taste bulbs on the tongue.

The nerves of taste are given us primarily that we may distinguish between good and bad foods. Instead of using them for this legitimate purpose, men often pamper them with highly-seasoned foods and drinks, until they become thoroughly demoralised, and demand such attention almost constantly. Meanwhile the unfortunate stomach is entirely worn out trying to deal with large quantities of food material of a character utterly unsuited to supply the real needs of the system. As a result the body is clogged with the products of imperfect digestion, and becomes the prey of disorders innumerable.

Plea for Simplicity.

We plead for simplicity in cookery. Simple things are easier to prepare and usually easier to digest. Moreover,

to an unperverted palate they really taste best. So every possible condition is satisfied. Fewer spices and condiments would make our cooking better. Hot things like pepper, cayenne, mustard, vinegar, Worcestershire sauce, and the like, have no proper place in a rational diet, and should be entirely discarded. If the food is properly selected, it will possess flavours of its own far superior to these harmful and irritating condiments which have no food value, and are taken solely to gratify a perverted appetite. Condiments do more actual harm than most people realise. Recently it has been discovered that the so-called "gin liver," which was supposed to be solely due to strong drink, may also be induced by the free use of vinegar. Catarrh of the stomach is said to be very common in Mexico, where the custom is to take huge quantities of red pepper.

Everybody knows how irritating such substances are to the delicate membranes of the nose and eyes, invariably causing a profuse flow of mucus to allay the inflammation. Beaumont found in the course of his elaborate researches that condiments produce a like irritating effect upon the lining membrane of the stomach, whose mucus cells they stimulate into unwonted activity. When the irritation is applied day after day, it is not surprising that a condition of chronic gastric catarrh should finally result.

Thorough Cooking of Cereals.

There is one point in which many otherwise efficient cooks fail; namely, in the thorough cooking of cereals. The famous Scotch porridge, made by pouring boiling water over oatmeal and stirring up with a little salt for seasoning, might be tolerated by the hardy digestive systems of a people living an active out-door life; but

it is not suitable food for the vitally depleted men and women of to-day. And yet where porridge is used at all, it is usually served in a half-cooked state.

Starchy foods are best prepared for the table by some form of dry heat, as baking or roasting. Boiling and steaming are other modes of cooking starch; but they require a much longer time to accomplish the purpose of cooking; namely, to burst the little envelopes in which the starch cells are enclosed. About three or four hours are required for the proper boiling of any of the common cereals, and this is best done by means of the double boiler, full directions being given in the recipe department.

Needless to say the objections to ill-cooked porridge also apply to all other starchy foods which are insufficiently cooked, such as half-baked pie-crust, or the soggy interior of a loaf of poorly-baked bread.

The Science of Cookery.

Healthful cookery must be scientific. The cook needs to know something about the properties of the different foods, and their degree of digestibility, the compatibility of one food with another, the kind of nourishment which the different food articles supply in the greatest abundance, and the best mode of preparing them for the table without loss of nutritive value.

Haphazard work is nowhere permissible; least of all in the kitchen, where the foundation of a healthy, happy home is usually laid. Everything should be carefully thought out and planned. The proper utensils should be procured, and kept each in its place. The cooking outfit for the average home ought to include a couple of good enamelled saucepans, a double boiler, baking tins, kettles, a suitable colander, and the other usual

accessories. If a gas range is available, it will usually be found more convenient and economical than the ordinary kitchener, which is a more or less inefficient piece of kitchen furniture when it comes to scientific cookery.

For the recipes which appear in the following pages we are largely indebted to Mrs. E. E. Kellogg and Dr. Lauretta Kress. The former, as head of the Battle Creek Sanitarium Cooking School and Experimental Kitchen, has exerted a strong moulding influence upon the system of cooking in general vogue in the large sisterhood of Sanitariums connected with the "Good Health" movement. In fact, Mrs. Kellogg is the originator of the system as regards some of its most distinctive features, and without doubt its ablest exponent. Dr. Lauretta Kress has also done excellent work in hygienic cookery, and her residence in Great Britain brought her in touch with the needs of its people, and enabled her successfully to adapt a number of standard recipes to the conditions existing here.

General Hints Explanatory of the Recipes.

The recipes which occupy a considerable portion of this section of the book are intentionally for dishes plain and easy of digestion; but if good materials are selected and care is taken to bring out the natural flavours of the various foods by judicious cooking, the result will be eminently satisfactory, both from the standpoint of health and that of palatability.

Condiments.

Pepper, vinegar, and other condiments of an irritating character have no place in these recipes. Salt is mentioned at times, though not in all recipes where its use

might naturally be expected, it being assumed that the users of this book will know when to introduce this condiment without special reminder.

Nut Butter.

Where mention is made of nut butter, the reference is to that made of peanuts, or almonds, or some similar nut. Such butters are emulsified fats, and always require to be rubbed smooth in water before being introduced. Cocoanut butter, on the other hand, is a free fat.

Nut Meal.

By nut meal is meant simply nuts which have been ground into a more or less fine meal by means of the Ida nut mill, or otherwise pulverised.

Seasoning.

The seasoning suggested has been mainly by means of the nut butter and nut meal just mentioned. Where these cannot for any reason be had, cocoanut butter or good cows' butter may be used, in which case the quantity may be slightly reduced. Sweet cream also makes a very good seasoning.



THE MILKMAID.

CHAPTER XII.

Simple Food Recipes.

UNLEAVENED BREADS.

YEAST bread, light and well-baked is quite wholesome but in nutritive qualities, as well as digestibility, it is inferior to unleavened bread. This, the most ancient kind of bread, is still in use in various forms throughout the world. The Mexicans make a dough of meal and water, and roll it out into flat cakes called "tortillas." Scandinavians roll it out still thinner, in great round discs, which go by the name of "fladbröd" (literally, "flat bread"), and the American Indians grind their corn into a coarse meal from which they make cakes that are baked in the ashes.

The crisp, nutty flavour of well-made unleavened bread is a revelation to those not acquainted with this article of diet, which is bound to become more and more popular as the public gives increased attention to food matters.

There are, roughly speaking, two kinds of unleavened bread, for the making of which recipes are here given; namely, those made from a batter, as gems; and those from dough, as rolls and biscuits. Batter breads to be a success must be made quickly. Have all materials to hand, measured, and proceed without delay, beating the air in briskly and evenly. These breads also require a



Fig. 89. Gem Pan.
(For baking batter breads.)

hot oven. It will need some practice to achieve the best results. Inexperienced persons would perhaps do well to add a beaten egg to the ingredients mentioned, as this will help to ensure lightness.

The rolls and biscuits do not require quite so hot an oven, and will be found, on the whole, easier of preparation. Have the materials as cold as possible, as these breads also depend for their lightness upon the expansion of air contained in the dough. The kneading is for the purpose of incorporating as much air as possible. The oven should be sufficiently hot to form a slight crust over the bread, and thus retain the air which has been incorporated. Properly baked, the rolls and biscuits will be crisp and toothsome, and the starch they contain being practically dextrinised by the intense heat, is very easy of digestion. Many persons not able to take fermented bread, in which the starch is not so perfectly cooked, can take biscuits and rolls with entire comfort.

It is hardly necessary to add that the ingredients should be of the best quality in order to secure satisfactory results. Some of the wheatmeals on the market are very inferior. It is worth while to take pains to get a good article.

Brazil Nut Rolls.—3 cups wheatmeal; 1 cup water; ½ cup Brazil nuts ground. Crack the nuts and with a sharp knife remove the woody covering; grind in a nut mill or chop very fine with a sharp knife. To half a cup of chopped nuts add one cup of water. Wheatmeal may be used, but the rolls will look prettier made with white flour. Knead thoroughly for five minutes, or until the dough is smooth and does not stick to the hands. Cut the dough into three parts, rolling each out separately with the palm of the hand over and over on a paste board until it is about three-fourths of an inch in thickness. Cut off pieces the length of a knife handle, bake on a perforated sheet, or on the oven grate, from thirty-five to forty minutes, or until a light brown.

Cocoanut Crisps.—1 cup pastry flour; 1 cup desiccated cocoanut. Rub the cocoanut through a colander or wire sieve to remove

coarse particles. To this add an equal quantity of flour, mix well together, wet with cold water sufficient to make a stiff dough, roll very thin, cut into three-inch squares, bake in a moderate oven. Walnuts or filberts may be used in this recipe instead of cocoanut.

Wheatmeal and Nutmeal Gems.—1 cup nut meal; 1 cup water; 2 cups wheatmeal. The nut meal for these gems can be prepared from Brazil nuts, Italian filberts, sweet almonds, walnuts or peanuts, by grinding in the Ida nut mill. Mix the nut meal and water thoroughly together. Into this beat sufficient unsifted wheatmeal to make a rather stiff batter, and when thoroughly beaten pour into very hot gem irons, placing immediately in a hot oven. Bake forty minutes.

Bran Gems.—1 cup cold water; 1½ cups unsifted wheatmeal; ½ cup bran. Take one cup cold water, beat it vigorously. Add slowly, beating all the time, the unsifted wheatmeal, and the half cup of clean bran. Beat all thoroughly after the meal and bran are in, then drop at once into heated gem irons.

Fruit Rolls.—3 cups wheatmeal; ½ cup nut meal; 1 cup cold water; ½ cup currants. Prepare as for Brazil nut rolls. When well kneaded, work into the dough one-half cup of currants which have been well washed and dried in a clean cloth. Form into rolls in the usual manner, and bake.

Fruit Biscuits.—3 cups fine wheatmeal; 1 cup nut bntter; 1 cup water; dates or figs. Prepare a dough with one cup of nut butter dissolved in the water, and three cups of fine wheatmeal. Knead well, and divide into two portions. Roll each quite thin, spread one thickly with dates or figs seeded and chopped, place the other one on top and press together with a rolling pin. Cut into squares and bake. An additional quarter of a cup of flour will doubtless be needed for sprinkling on the board for kneading.

Nut Crisps.—1½ cups wheatmeal; ½ cup walnut meal; ½ cup cold water. Mix together thoroughly one and a half cups of coarse wheatmeal and one-half cup of walnut meal, prepared by pressing the chopped kernels of nuts through a fine colander or grinding in the nut mill. Make into a stiff dough with water as cold as possible, knead well, roll into a very thin sheet, cut with a knife into squares, and bake on perforated tins until lightly browned.

Wheatmeal Crisps.—Into one cup of cold water, stir slowly, so as to incorporate as much air as possible, sufficient wheatmeal to make a dough stiff enough to knead. Roll very thin, cut into squares, prick with a fork to prevent blistering, bake until a light brown. Made from a good quality of wheatmeal, these crisps are delicious. Be careful not to get them too brown.

Oatmeal Biscuits.—4 cups rolled oats; 1 cup pastry flour; 1¼ cups cold water; 1¼ cups nut meal. Mix the flour and rolled oats together, adding the nut meal dissolved in water. Knead well, roll out, cut in squares one-fifth inch thick. Prick with a fork or nut pick to prevent blistering. Bake in a moderate oven.

BREAKFAST DISHES.

White bread and butter and a cup of tea make a poor sort of meal on which to begin the hard work of the day. Light, unsatisfying breakfasts often drive men to stimulants with which to keep up strength. The ideal breakfast should be composed of foods which will be fairly easy of digestion, yet at the same time thoroughly nourishing and able to stand by the man who has hard work to get through before the hour of lunch or dinner. The following dishes are for the most part simple and inexpensive, and will help to give a pleasing variety to the first meal of the day:—

It is necessary first to tell how to prepare that which is the foundation of these dishes; viz.,—

Zwieback.—Zwieback, or "twice-baked bread," is made by cutting wholemeal or white bread into slices, placing these in a slow oven and leaving them for an hour or more, until thoroughly dried and very slightly browned. This second baking changes the starch to dextrin and renders it more easily digested, dextrin being readily changed to sugar by thorough mastication and mixture with the saliva.

Fruit Toasts.—Fruit toasts are among the simplest as well as the most wholesome and pleasing of morning dishes. A piece of toast is slightly moistened with a very little hot water or hot rich milk, and then served with a dressing poured over it consisting of fruit juice or simply stewed fruit which has been thickened to about the consistency of gruel with a little cornflour, and sweetened to taste. Gooseberries, plums, greengages, cherries, blackberries, strawberries, grape-juice, prunes, peaches, apricots, and a lot of other fruits lend themselves admirably to such treatment, and make up a fine variety of dishes that are easily prepared, and very palatable. Fruit toasts may be further improved by serving with each little dish of toast a dessertspoonful of ground nuts or nut cream or

dairy cream. It is not well to use the latter, however, in case the fruit used is of strongly acid character, neither is it well in such case to moisten the toast with milk, water being more suitable.

Besides fruits and fruit juices, other dressings, prepared from tomatoes, lentils, etc., may be used as indicated below. The little square of toast should be neatly prepared, and served with the dressing, etc., in as dainty a fashion as possible.

Lentil Toast.—Pour over slices of moistened zwieback the lentil dressing given on the following page under the heading "Dressings for Toasts and Cereals," and serve hot.

Tomato Toast.—Moisten slices of zwieback with hot water or milk, and pour over each a couple of tablespoonfuls of the tomato dressing, for which directions are given on a later page.

Milk Toast.—Pour hot, rich milk over slices of zwieback (white or brown), and serve at once.

Milk Toast with Poached Egg.—Prepare as in the foregoing, and place on top of the toast a nicely poached egg. This makes a delicious breakfast dish on a cold winter's morning. It should be served hot. This may be ensured by warming the dish before pouring on the milk. Use enough milk to moisten thoroughly the slice of toast.

Gravy Toast.—Pour a hot gravy made by thickening milk with cornflour over slices of white zwieback slightly moistened with hot milk or hot water. The yolk of an egg may be added to the gravy to give it a rich colour.

PORRIDGES.

Porridge made from oatmeal, maizemeal, etc., ought to be prepared in the double saucepan, and cooked about three hours. This may be done the day before, and then the porridge can be warmed over for use at breakfast. When cooked in the usual fashion in a few minutes, these porridges are liable to cause serious difficulty, except in the case of persons of exceptional digestive powers. When prepared in the ordinary kettle over a hot fire, and stirred continually to keep from burning, fine oatmeal may be cooked in an hour so that it will be fairly digestible for healthy people; but it is safer to use the longer method and the double saucepan. In using the latter, first bring the

cereal to the boil, by placing the inner saucepan directly over the gas flame; then place it inside the outer saucepan, into which boiling water has been meanwhile introduced. This may now be placed over a small flame and left without any fear of burning. Cereals prepared in this way are perfectly wholesome and digestible, though it is advisable to eat hard biscuits with them to encourage mastication.

Avenola Porridge.—2 cups water; 1 cup avenola. Avenola makes an appetising dish, and is quickly prepared on account of having been thoroughly cooked in the course of manufacture. Stir one cup of avenola into two cups of boiling water. Let it cook five minutes, and serve with gluten dressing or cream. For a change use milk instead of water in making the porridge.

Avenola and Dates.—Prepare as in the preceding recipe, and add a handful of stoned dates. Serve with a little thin cream, or with the same dressing as for fruit toast.

DRESSINGS FOR TOASTS AND CEREALS.

The following dressings may be served with cereals or on slices of toast;—

Tomato Dressing.—Slice one pint of fresh tomatoes, stew, and when well done pass through a colander or strong sieve to remove the seeds and skins. Return to the fire, add one tablespoonful of pastry flour or cornflour rubbed smooth in a little water; cook till it thickens. Season with one tablespoonful of nut butter rubbed smooth with a little of the tomato juice. Boil up at once and serve. Tinned tomatoes will do as well as fresh ones.

Lentil Dressing.—1 cup red lentils; 3 cups boiling water; 1 tablespoonful brown flour; 1 tablespoonful nut butter. Cook the lentils in the water till they are well done, and then pass through a colander. If not thin enough, add more water, also one tablespoonful of nut butter rubbed smooth in a little water. Let all boil up together, and serve as a dressing over cereals. This is a good dressing for porridge of avenola, maizemeal, or oatmeal, as well as on toast. It may be quickly prepared from lentils left over from the dinner of the day before.

Gluten Dressing.—2 cups boiling water; 1 tablespoonful nut butter; 1 tablespoonful gluten meal. Stir the nut butter into the water carefully, then boil; when boiling sift in one tablespoonful of gluten meal. When it boils up, it is ready to serve.

MUSCLE-FORMING FOODS.

Worn-out muscle is repaired by proteid, the most important element in the diet. It is important that the principal meal of the day should include one or more dishes rich in this building material. The following recipes are of this character, and almost any of them may figure as the *piéce de résistance* at a wholesome, satisfying dinner:—

Lentil Roast.—1 cup strained stewed tomato; 1 cup cooked lentils; 1 cup avenola (or toasted bread crumbs); 1 tablespoonful finely minced celery; and a little cocoanut or dairy butter. Rub the lentils through the colander, mix the avenola or bread crumbs, lentils, and tomato together, and add the seasoning. Turn all into the baking-dish, and bake in an oven until lightly browned and quite dry. Serve in slices with a sauce made by cooking together for a few minutes two cups of lentils prepared as above, one cup of strained stewed tomato, and a tablespoonful of peanut butter. The lentil or tomato dressings given on a foregoing page may also be used.

Protose Roast. No. 1.—Place one pound of sliced protose in the bottom of a small dripping-pan, with a few slices of onion. Cover with water, and bake slowly for several hours. Three-quarters of an hour before serving, pare and quarter lengthwise three or four large potatoes and place in the pan. Sufficient water should be added to keep from burning.

Protose Roast. No. 2.—Use one-half pound of protose as it comes from the tin. Press into the sides of this one large onion which has been sliced thin, and sprinkle with salt. Place in a baking-dish, and surround with a nut cream made by dissolving one-fourth cup of nut butter in one and one-half pints of water, and salt to taste. As it bakes in a hot oven, baste occasionally with the dressing until the protose and onion become a rich brown. The time usually required for baking is from one and one-half to two hours. Serve with each spoonful of protose two or three spoonfuls of dressing.

Pine Cones.—1 cup of pine kernels; 1½ cups of avenola; 2 cups water; a little parsley or sage. Wash the pine kernels, place in the oven and brown slightly. When done, grind through a nut mill, or roll with the rolling-pin on a paste board. Add the avenola and moisten with the water. Mix thoroughly, adding

a little parsley minced finely, or sage if preferred. Mould with the hands into small cones, and bake till a light brown. Crushed zwieback or toasted bread crumbs may be used in place of the avenola, in which case a trifle less water will be required.

Nuttolene with Avenola.—Chop a half-pound of nuttolene quite fine. Mix together two cups of avenola and three of warm water. Season with a little pulverised sage, minced parsley, or celery. Put alternate layers of seasoned avenola and nuttolene in a baking-dish, finishing with the nuttolene. Pour over this one cup of water, press together slightly, and bake in a moderate oven until lightly browned. It can be served with brown sauce.

Nuttose and Macaroni.—1 cup macaroni; ½ pound nuttose; 1½ cups water; 1 tablespoonful nut butter. Break into two-inch lengths enough macaroni to fill a large cup; cook in boiling water until tender. When done, drain. Put a layer of macaroni in a baking dish, sprinkle with a layer of finely chopped or grated nuttose; add a second and a third layer, sprinkling each with nuttose. Turn on the whole one cup and a half of water, with three tablespoonfuls of nut butter dissolved in it. Bake in a moderate oven till lightly browned. Nuttolene may be used instead of nuttose.

Grilled Protose.—Cut in slices, spread with the least bit of cocoanut or the best dairy butter, lay on the grill, turn carefully, and serve hot.

Nut and Lentil Roast.—3 pints cooked lentils; 1 pint stewed tomato; 1 cup walnuts chopped; 1 tablespoonful nut butter. Rub the lentils through a colander, strain the tomato to remove seeds and skins. Mix all well together. Pour into a baking-dish and brown in the oven.

Nut Cheese.—1½ cups peanut butter; 2 cups water or caramel cereal coffee; white flour as needed. Mix together nut butter and water. Add to this enough white flour to make a stiff batter, and a little salt. Turn into a basin, set in a steamer, and steam three to five hours. It may be put into tins or a bucket with a close-fitting cover, and then boiled in a large saucepan.

Curd Cheese.—Fresh milk brought to the boiling point, and curdled with a little lemon juice makes a perfectly wholesome cheese. It can be eaten plain, or seasoned with a little cream and salt and made into little balls.

Mashed Peas.—1 quart peas; 1 tablespoonful nut butter. Soak one quart of dried green peas in cold water overnight. In the morning drain and put to cook in warm water. Cook slowly until perfectly tender, allowing the peas to simmer very gently toward the last until they become as dry as possible. Put through a colander to remove the skins. Add one tablespoonful of nut butter rubbed smooth in cold water, and a little salt. Turn into a baking-dish, and brown in the oven. One-third or one-half toasted bread crumbs or zwieback crumbs may be used with the peas when desired. A savoury dish can also be made by adding celery, sage, parsley, or onions minced fine. Serve with a sauce prepared as follows: Heat one pint of strained stewed tomato. When boiling thicken with a tablespoonful of flour rubbed smooth in a little water. A little salt may be added.

Mashed Haricots.—Soak over night a quart of small haricots. In the morning drain the water off, and put to cook in boiling water. Boil till perfectly tender, when the water will have nearly evaporated. Rub through a colander to remove the skins: add salt and a tablespoonful of nut butter. Put into a shallow pie-dish, smooth the top with a spoon, and brown. If preferred, half zwieback crumbs may be used with the beans. Slices of lemon served on the well browned surface make a pleasing effect.

Baked Haricots.—1 quart haricots; 1 tablespoonful sugar; two tablespoonfuls cocoanut butter. Proceed as in the foregoing recipe until the beans are nearly done, then add the sugar and butter with a little salt. Turn into a baking-dish, and brown nicely.

Butter Beans.—Put the beans into boiling water, and cook till tender, but not till they fall to pieces. Simmer slowly, but do not boil hard. They should cook nearly dry. A teaspoonful of nut butter to each pint of beans may be added if desired.

VEGETABLES AND SAVOURIES.

Baked Potatoes.—Select uniform-sized potatoes, wash well, and dry. Bake one hour in a moderate oven. Just before serving, prick them to allow the steam to escape, and they will be quite ready. Serve with brown sauce.

Potato Stew with Protose.—Prepare the protose by cutting into small cubes or slices and putting to stew in a sufficient amount of water to cover it an inch deep. Stew slowly for an hour or more. When nearly done add some thinly sliced potatoes, and cook together till the potatoes are tender. There should be enough liquor in the protose so that additional fluid will not be needed. Salt and serve.

Brussels Sprouts with Steamed Potatoes.—1 lb. Brussels sprouts; 1½ lbs. potatoes; 1 tablespoonful nut butter. Clean the sprouts carefully, letting them stand a while in cold water. Pare potatoes, and put all together in a steamer. Let them steam steadily until well done. When done remove from the steamer, mash, and add one tablespoonful nut butter, mixed with a half cup warm water. Mix all together well, bake or return to the steamer, until ready to serve.

Vegetable Pie.—1 cup chopped carrots; 1 cup finely sliced beans; 1 teaspoonful nut butter; 2 cups sliced potatoes; a small piece of parsley or onion. Stew all together in as small an amount of boiling water as possible to retain the salts. If too thin, a few zwieback crumbs can be added to thicken. Turn into a baking-dish, and cover with mashed potatoes, freshly made, having been boiled in a very small amount of water or steamed, so that there is no water to drain off. Smooth over the top, place in the oven to brown, and when done garnish with a few sprigs of parsley and serve.

Stuffed Potatoes.—Bake in their jackets nice large potatoes until well done. Cut off one end, remove the pulp and mix with one-third mashed protose, and a little chopped onion, if desired. Fill the jackets with this mixture, and serve at once.

Scalloped Potatoes.—Pare the potatoes and slice thin. Put them in layers in an earthen baking-dish or granite bowl, and sprinkle each layer with a little meal. Pour over all enough hot water to cover, in which two tablespoonfuls of nut butter have been stirred. Cover and bake rather slowly till tender, removing the cover just long enough for the potatoes to brown before serving. Cold boiled potatoes can be served in the same way. If preferred, rich milk may be used in place of hot water and nut butter.

Vegetable Hash.—1 quart sliced potatoes; 1 carrot; 1 red beet; 1 white turnip; celery. With one quart of finely sliced potatoes, chop one carrot, one small red beet, one white turnip, all boiled, also a few pieces of celery or onion. Put all into a saucepan, cover closely, and let simmer on top of the stove. When hot, pour over them a cup of boiling rich milk or nut cream made by stirring one tablespoonful of nut butter in a cup of water. Stir well together, and serve hot.

Vegetable Marrow.—Peel and cut in slices a nice fresh vegetable marrow, steam in a steam cooker until tender. Over this serve a dressing of one tablespoonful of nut butter dissolved in one cupful of water. Add salt to the water. Marrow steamed in this way is delicious.

Stuffed Vegetable Marrow.—Make a hole in the side, and take out the seeds. Stuff it with a paste made of zwiebaek erumbs or toasted bread erumbs, grated nuttose, and a little mineed parsley and salt. When stuffed, eover the hole with oiled paper, and place that side down in an oiled baking-dish. Add a little water, and bake in the oven. Baste oeeasionally with the water in the dish, and when it ean be easily piereed with a straw, it is done. Serve slieed erosswise. Egg plant ean be used in the same manner.

Nuttolene and Green Vegetables.—Green peas, Freneh beans, beet or turnip tops, and spinaeh are very nice eooked with nuttolene. Add nuttolene in the proportion of one tablespoonful of small eubes finely ehopped to one pint of vegetables. Cook together until well done and serve. Protose ean be served in the same way.

Cauliflower with Tomato Sauce.—1 large cauliflower; 2 eups tomato; 1 tablespoonful flour; 1 tablespoonful nut butter. Trim the waste and leaves from the eauliflower, eut into pieees, plaee in a steamer, and steam until done. Prepare the tomato sauee by heating the strained tomato to boiling, thieken with the flour rubbed smooth with a little water. Add nut butter or a very little dairy butter, pour over the eauliflower, and serve hot.

Savoury Lentils.—Cook brown lentils slowly until perfeetly tender, allowing them to simmer gently toward the last so as to become as dry as possible. Put through a eolander to remove the skins. Take equal quantities of this lentil pulp and zwiebaek erumbs. Moisten with half a eup of water, into whieh a dessertspoonful of nut butter has been dissolved. Or for a ehange use half a cup of ehopped walnuts and half a eup of water. Season with a little powdered sage. Turn into a baking-dish, and bake until well browned. Serve with tomato sauee.

Macaroni Baked with Avenola.—1 eup maearoni; 1 cup avenola: 1 tablespoonful nut butter. Break into pieees, about an ineh in length, suffieient maearoni to fill a large eup, and eook until done. When done, put a layer of maearoni in the bottom of a baking-dish, and sprinkle over it a teaspoonful of avenola. Add a seeond and a third layer, and sprinkle eaeh with avenola. Pour over the whole one tablespoonful of nut butter dissolved in a pint of water. Bake for a few minutes only.

GRAVIES AND SAUCES.

Tomato Sauce.—1½ cups strained stewed tomato; 1 tablespoonful mashed nuttolene; 1 seant tablespoonful flour. Add nuttolene to the strained tomato, cook ten minutes, and thicken with flour mixed with a little water. Serve hot.

Nuttolene Sauce.—Dissolve a dessertspoonful of nuttolene in a pint of warm water. Heat to boiling, and thicken with one and a half tablespoonfuls of flour which has been lightly browned in the oven. Cook thoroughly and serve. If preferred one tablespoonful of browned flour and one-half tablespoonful of ordinary white flour may be used. This will thicken the sauce more than browned flour used alone.

Brown Sauce.—Heat one-quarter cup of nut oil or olive oil in a saucepan without browning. Stir into this three heaping tablespoonfuls of flour, and pour in a pint and a half of boiling water, in which a few pieces of celery have been simmering to impart their flavour; also one tablespoonful of nuttolene which has been rubbed through a sieve and made into a smooth paste with some of the hot water. Very nice served with nuttose and avenola roast or with baked potatoes.

Lentil Sauce. No. 1.—Rub a cupful of cooked lentils through a colander, to remove the skins. Add one cup of boiling water, heat to boiling, and thicken with a tablespoonful of peanut butter or nuttolene.

Lentil Sauce. No. 2.—Cook some brown lentils with a few slices of onion to flavour them. When tender, rub through a colander, and add one-half the amount of strained stewed tomato, also add a tablespoonful of nut butter to each quart of sauce. This is excellent served with baked potatoes, and also on toast.

Nut Sauce.—Heat to boiling a quart of water in which a tablespoonful of nut butter has been dissolved. Thicken with three tablespoonfuls of browned flour. Cook thoroughly for five or ten minutes. Serve hot.

White Sauce.—Heat in a saucepan a pint of rich milk to boiling, and stir in a heaping tablespoonful of white flour which has been rubbed smooth in a portion of the milk reserved for this purpose. Cook for a few minutes being careful not to burn. Season with salt, and serve at once. If the milk is not rich, a very little of the best dairy butter may be added.

SOUPS.

The following soups will be more appetising and healthful if a few croutons are served with each plate. To prepare the croutons cut slices of white or brown bread into cubes, and bake in a slow oven till perfectly crisp, and very lightly browned throughout.

Haricot Bean Soup.—For two quarts of soup, soak one pint of haricots over night. Put to cook in the morning in warm water. Boil slowly for two hours. When done they can be passed through a colander or sieve, and served with the addition of salt for seasoning, and if desired a little nut or dairy butter.

Butter Bean Soup.—For two quarts of soup use one pint of butter beans. Put to cook in warm water till thoroughly done. Rub through a colander, return to the fire, thin with water, season with a little salt, also a small piece of onion or celery, if the flavour is desired.

Bean and Tomato Soup.—1 pint boiled beans; 1 pint stewed tomato; 2 tablespoonfuls nutmeal. Rub the beans and tomatoes together through a colander. Add salt, two tablespoonfuls of nutmeal, made by grinding the nuts in a nut mill; or add one-half cup nicely steamed rice. In either case add also sufficient boiling water to make the soup of the desired consistency. Reheat and serve.

Lentil Soup.—1 pint red lentils; small piece of onion. Cook one pint of red lentils in a small quantity of water. When about half done, add a small piece of onion for flavouring. When done, rub through a colander. Add a little nut butter, mixed first with hot water to form a cream, and salt. Serve hot. Dairy butter or cream may be used instead of nut butter.

Split Pea Soup.—1 cup split peas; 2 pints boiling water; 2 tablespoonfuls browned flour. For each quart of soup desired, simmer a cup of split peas, very slowly, in three pints of boiling water for several hours, until thoroughly dissolved. When done, rub through a colander, reheat, and when boiling stir into it two teaspoonfuls of flour slightly browned, rubbed smooth in a little cold water. Boil until thickened, and serve. If preferred, the soup may be flavoured with a little onion. Salt to taste.

Vegetable Pea Soup.—1 pint split peas; 1 small onion; 1½ pints sliced potato. Cook peas until dissolved. When nearly done, put to cook one and a half pints sliced potato, one medium-sized onion sliced thin, and a piece of parsley. When tender rub all through a colander, add water to make of a proper consistency, and salt to taste, reheat, and serve.

Vegetable Soup.—6 large potatoes; 1 carrot; a little parsley; a little onion; 1 teaspoonful nut butter. Peel and put into cold water one-half dozen good-sized potatoes cut into small pieces, one carrot, a small piece of onion, a little mint and parsley. Boil together until tender, in three pints of water. Season with salt, and add a teaspoonful of nut butter rubbed smooth in a little water.

Rice Soup.—½ cup rice; 2 cups water; 2 cups milk. Cook rice in the water; add milk; reheat and serve. If desired, use a larger proportion of milk, and the flavour will be richer.

Tomato and Vermicelli Soup.—1 quart tomato; ½ cup vermicelli; ½ cup nut cream. Strain one quart stewed tomatoes through a colander to remove the seeds and skins. Drop vermicelli into a cupful of hot water; cook until done, which requires only a few moments. Then turn into the tomato, heat together, season with salt, and add half a cup of nut cream. Serve hot.

Digestive Lentil or Pea Soup.—Excellent lentil soup may be prepared in a few minutes by stirring into boiling water equal parts of Digestive lentil flour and ordinary white flour, adding a little salt and, if desired, a grated onion for flavouring. Pea soup may be made in the same way by using the Digestive pea flour.

SALADS.

Baked Banana Salad.—A variety of salads may be prepared from this very common fruit. Peel the banana, roll lightly in sugar, place in a granite or porcelain pan, and bake in a moderate oven for twenty minutes. Dress with sour fruit juice thickened to the consistency of cream by adding a little cornflour, and sweeten to taste. A lemon sauce, made of one cup water, one tablespoonful cornflour, and the juice of half a large lemon sweetened to taste, makes a desirable dressing. Cut the baked banana in slices, place in the centre of the dish upon which a leaf of lettuce has been laid, and dress with the sauce.

Baked Banana Salad. No. 2.—Prepare as for the above, but serve whole on a plate with salad dressing over the centre of the banana, leaving the ends exposed, and resting on a leaf of lettuce.

Pineapple Salad.—Carefully stir together sliced fresh or tinned pineapple and sweet salad dressing. Serve on a garnish of lettuce leaves.

Apple and Pineapple Salad.—Prepare as in the foregoing recipe using equal parts of finely sliced pineapple and tart apples. (As soon as the apples are cut, they should be added to the salad dressing, to avoid discolouration.)

Apple Salad.—Prepare as for apple and pineapple salad, leaving out the pineapple.

Tomato Salad.—1 pound tomatoes; ½ cup chopped celery. Peel and slice the tomatoes. Mix the chopped celery with sour salad dressing, and serve on the tomatoes in a salad bowl.

Protose Mayonnaise.—Cut protose into small cubes, and add one part of mayonnaise dressing to five parts of protose; serve on a garnish of green.

Asparagus Salad.—Dress cooked asparagus tips with sour salad dressing.

Beet Mayonnaise.—Follow the directions for protose mayonnaise, using cold, chopped beets instead of protose.

Mayonnaise Dressing.—Beat together enough to blend four large eggs, one-half cup nut oil or pure olive oil, one scant cup lemon juice, and one well-rounded teaspoonful salt. Put into a double boiler containing warm water, and heat, stirring continuously until it begins to thicken. Then remove from the outer boiler, and set in a dish of cold water, stirring until partially cooled.

Sour Salad Dressing.—Rub two slightly rounded tablespoonfuls of peanut or almond butter smooth with two-thirds of a breakfast cup of water. Let this cream boil up for a moment over the fire. Remove from the stove, add one-half teaspoonful salt and two tablespoonfuls lemon juice. Cool, and it is ready for use. If too thick, it may be thinned with a little lemon juice or water. More salt and lemon juice may be added if desired. By using a scant cup of strained stewed tomato in place of the water in the foregoing, one has another palatable and pretty dressing.

Sweet Salad Dressing.—Rub two rounded tablespoonfuls of almond butter smooth with two-thirds of a cup of water, add two tablespoonfuls sugar, and one-fourth tablespoonful salt; cook as for sour salad dressing, and add two tablespoonfuls lemon juice. When a yellow colour is desired with either the sweet or the sour dressing, have the beaten yolk of an egg in a bowl, and just as you remove the dressing from the fire, pour it over the egg a little at a time, stirring well at first. When the egg is used, a little less water and more lemon juice may be required. This sweet dressing is especially palatable on finely sliced apples: apples and celery; apples and very ripe bananas; strawberries and bananas; or pineapple and orange.

WHOLESOME DESSERTS.

Prune or Plum Tart.—1 lb. prunes; 1 quart water. Select sweet prunes, wash and stew in one quart of water until the water is reduced to a syrup. Cool; remove the stones, and rub through a colander to remove or break up the skins. When done, the prunes should be thick like marmalade. Turn into a crust of avenola, and bake. For a change, use fresh, ripe plums instead of prunes, sweetened to taste.

Avenola Crust.—Mix together in a basin one cup of avenola with one cup of nut cream, made by dissolving two tablespoonfuls nut butter in a cup of water. (Rich cow's milk may be used instead of the nut cream.) When the avenola has absorbed the milk, turn into a shallow pie-dish, press firmly with a spoon into all parts of the dish, so that it lines it completely inside, then turn the prune filling into it, and bake. This crust is very quickly and easily made. At the same time it is very digestible. A person who must avoid ordinary pastry can eat a prune tart with no discomfort. Other fillings may be used.

Almond Nut Paste.—Take equal parts of sifted pastry flour and sweet almond meal. Mix together thoroughly. Moisten the mixture with water as cold as can be had, sufficient to make a soft dough. Do not knead much. Roll out quickly, making an upper and under crust for the pie. This makes a very wholesome and palatable crust.

Apple and Apricot Tart.—1 lb. apple rings; 1 cup apricots. Wash and put to cook the apples and apricots in just enough water to cover, stew slowly for several hours, rub through a coarse sieve or colander to remove skins or uncooked pieces. Turn into an avenola crust, and bake like a prune tart. Apples or apricots can also be used alone.

Baked Bananas with Avenola Crust.—1 cup avenola; 1 cup cold water; 4 bananas. Moisten the avenola with water. Peel the bananas. With the hands mould the avenola round the bananas. Bake in a moderate oven till done, and serve without dressing. Those who can eat bananas in no other way will usually find them wholesome and delicious in this form.

Cocoanut Butter Paste.—1 oz. cocoanut butter; 1 cup flour. Use in the same manner as ordinary shortening. For many persons this crust is not quite so easy of digestion as the almond nut paste or avenola crust. The quantity of cocoanut butter may be slightly increased if desired.

Tapioca Pudding.—1 cup tapioca; 1 quart boiling water; 1 cup seedless raisins; 1 cup chopped almonds. Soak the tapioca in one pint of water overnight. Put to cook until clear in a quart of boiling water; then stir in the seedless raisins and chopped almonds. Cook an hour longer, and turn into the mould. Serve cold with sweet almond meal sprinkled over it.

Bananas in Syrup.—1 cup red currant juice; 1 cup raspberry juice; 1 tablespoonful sugar; 1 dozen bananas. Express the juice from currants and raspberries by boiling and straining through a sieve. To the pint of juice add the sugar, and heat again in a

saucepan. When boiling, drop into it the bananas which have been pecled, and simmer slowly for twenty minutes. Remove the bananas carefully, boil the juice until it thickens to the consistency of syrup, and pour over the fruit. Serve cold.

Apple Pudding.—1 cup raisins; 1 cup chopped apples; 2 cups zwieback crumbs. Chop the apples and raisins together, mix well with the zwieback crumbs. Place in a baking-dish in the oven until nicely browned, or till the apples are well cooked. It is then ready to serve. No dressing is required, but a very little cream makes it more delicious.

Granose Shortcake.—Open granose biscuits lengthwise. Lay them side by side in a flat dish, spreading over them crushed and sweetened strawberries or raspberries. Add another layer of granose, and over this more strawberries. Serve at once. If the berries are a little dry, a few spoonfuls of water may be added to them. Granose flakes may be used instead of the biscuits.

BEVERAGES.

Clover Tea.—Clover heads gathered at the season of the year when they are most plentiful, and carefully dried in a hot sun or in the oven, make when steeped for a few minutes a very delicately flavoured and perfectly wholesome beverage, which may be served with cream and sugar in the usual way. After drying, the clover heads may be placed in leather bags and kept in a dry place through the winter.

Rice Water.—Boil rice in water, draw off the latter and add lemon juice and a little sugar to taste. Mild and refreshing.

Lemonade.—Take the juice of half a small lemon, turn into a glass, add one heaping dessertspoonful of sugar, and water to fill the glass. May be taken hot or cold.

Mixed Lemonade.—Take the juice of half a lemon and half an orange, add sugar to taste, and water to fill the glass. Various other fruits can be used in place of the half-orange, as pineapple, raspberry, or currant juice. The juice of tinned pineapples added to lemon juice also makes a very good drink.

Fruit Sherbet.—½ dozen oranges; 4 lemons; 1 cup gooseberry juice; 1 cup cherry juice. Remove the juice from the oranges and lemons. Stew gooseberries and cherries separately; when done, strain, and add this juice to that of the oranges and lemons. Mix all together, and sweeten to taste.

Recipes for some further beverages will be found in the chapter which follows.

CHAPTER XIII.

Foods for the Sick.

IT would be hard to over-estimate the importance of rightly catering to the dietetic needs of the sick. This is important all the way along; but once convalescence has set in, final recovery is very largely a matter of diet.

General Principles.

What are the general principles underlying invalid cookery? — Not so very different from those which govern the preparation of food for persons in health; for, as a physician has well said, the sick man is simply a well man in a state of embarrassment. A perfectly healthy person may for a time disregard hygienic laws, and subject his digestive organs to many an extra strain without noticing any well-marked evil effects. The invalid's stomach cannot tolerate any such additional embarrassment; for it is at best a crippled organ, and must be handled most carefully if it is to work at all.

Losses to be Made Good by Food.

The whole system of the invalid is in a run-down condition; his stock of animal vigour is depleted, his strength has departed. All these losses in strength and vitality must be made good again through the food he eats. Then he ought to have a great deal of nourishment, someone will say. Yes, but on the other hand, his feeble digestive and assimilative powers allow him to

take but little. It is not the food one eats, but that which is digested and assimilated, that brings strength to the body, and builds up its broken-down tissues. The invalid must have a reasonable amount of nourishing, wholesome, easily-digested food, that he may by its use create new supplies of energy, and build himself up in health and strength once more.

The precise nature of the food as well as the frequency of its administration will depend on the individual case, and, of course, on the instructions of the physician in charge. At times only fluid foods are allowed, and then the fruit juices and gruels given at the close of this chapter may be found useful.

Care in Selecting Fruit.

Fresh fruits of the best quality and fully ripe are usually allowed invalids; but extreme care should be taken in selecting them. Much of the fruit on the market is either in a state of decay from over-ripeness or not ripe enough, and in the latter case containing considerable quantities of raw starch, a most indigestible product for the invalid's stomach.

Bananas Must Be Ripe.

Among the fruits most suitable for invalids, we might mention strawberries, pears, peaches, sweet oranges, bananas, greengages, sweet cherries, grapes, and apples. The latter must be mellow, and even then would best be scraped. Bananas are not fit to eat until in the ripening process the raw starch has been changed into sugar. They are then very sweet, and may be quickly reduced to a fine pulp in the mouth. If there is any question as to the ripeness of a banana, it is safest to bake it before giving to an invalid.

Seed fruits such as raspberries, blackberries, and black-currants may be stewed, and their juices served in the form of cooling drinks. Of course, only the juice of the orange should be swallowed, and not the woody part. The same would be true of melons, which may be allowed if in perfect condition and sweet.

Dried Fruits.

Of the dried fruits, which may be prepared for the invalid by gentle stewing or steaming, we would specially mention sweet prunes, sultanas, raisins, and figs. Dates require no cooking, and if well chewed may usually be taken.

Very acid fruit is not as a rule suited to the sick unless diluted freely with water, in the form of a drink; and then it should not be overmuch sweetened, as the sugar of commerce is not an ideal food for invalids. The natural sugar found in such sweet fruits as dates, sultanas, and figs, is on the other hand perfectly wholesome and a valuable source of energy.

How to Prepare Eggs.

Eggs, if they agree, are valuable in the sick-room, as containing in a form easy of digestion considerable quantities of proteids, fats and mineral salts as well as carbohydrates. They should be prepared by poaching or boiling; fried eggs and omelettes are somewhat difficult of digestion. If an egg is placed in water at a boiling temperature, covered, and left there about twenty minutes, it will be found in ideal condition for eating, the yolk being firm and the white of a delicate jelly-like consistency in which it is most palatable as well as most digestible. The receptacle containing the water should be in a warm place, but not over a burner. An easier

and almost equally good way of preparing eggs is to drop them into water at a boiling temperature and sufficiently deep to cover them, and allow to remain over the burner till the water begins again to boil; then set aside, and remove the eggs after six minutes.

Cereal Foods.

Cereals should be thoroughly cooked; otherwise they are likely to give trouble. When the patient is able to take solid foods, zwieback will be found useful, either plain or with a little butter, or in the form of fruit or nut toasts, as given in another chapter. The nut rolls and crisps, chewed well, will also prove grateful.

Of prepared foods, granose flakes, bromose, and malted nuts are perhaps the most valuable. The flakes are so light and delicate, and the starch they contain is so completely dextrinised, that they can often be taken when the stomach rejects everything else, and their nourishing qualities are exceptionally good.

Fried articles of all kinds are unsuited to the invalid on account of being difficult of digestion. Coarse vegetables, as cabbages, turnips, beetroot, cucumber, radishes, onions, etc., are not likely to do good, containing exceedingly little nourishment, and that little difficult to extract.

Hot toast soaked with melted butter is not a suitable invalid food. It would be better to moisten the toast with a little hot cream or rich milk.

Beef Tea Not to be Relied Upon.

Beef tea was once considered a valuable food for the sick-room; but the leading medical men of the day condemn it, alleging that its only possible use would be as a stimulant, since it contains mainly tissue extractives with a little gelatine. It is believed that dependence on

beef tea as a food for invalids has led to the death by starvation of thousands of inmates of hospitals.

Flesh foods in general are not good for the sick because of the impurities they contain. If there are cases where the patient temporarily is not able to relish other foods, it may be necessary to resort to them for the moment; but as a rule it will be found that the judicious use of milk, cream, eggs, and the best dairy butter will supply everything required in the line of animal foods.

Setting of the Tray.

In making up trays for the sick-room, one should avoid lavish display of foods. Rather let the quantities be small, as the patient can easily ask for more. There is nothing so sure to spoil a feeble appetite as large quantities of food coarsely served. Everything about the invalid's tray should be as neat and dainty as loving skill can make it. Hot foods should be served *hot*, not lukewarm; and cold foods should be served cold. A little spray of greenery, or a rosebud will help wonderfully to light up the tray; but even flowers should not be in too great evidence.

Fruit should be carefully cleansed, and apples should be polished with a clean soft cloth till their rich colouring appears in all its beauty. Of course, extreme care should be taken in the preparation of food in the kitchen. Anything suggestive of uncleanliness is enough to turn the stomach of an invalid.

Little Surprises.

Don't ask the patient what he wants, but serve the foods suitable to the case in as attractive a variety as possible, and endeavour to plan little sur-

prises. Always have the meals ready at the appointed hour. This is of the greatest importance.

Do not urge food upon the patient. In fevers it is often just as well to withhold food altogether during the first twenty-four or forty-eight hours, giving always as much pure water as can be taken comfortably.

Finally, do not give your patient certain articles of food simply because they are sent by friends. The rich jellies and preserves often supplied in this way by well-meaning people, are quite unsuited to the needs of an invalid.

RECIPES.

Arrowroot Gruel.—1 dessertspoonful pure arrowroot; 1 cup boiling water. Stir the arrowroot into two tablespoonfuls of cold water, forming a thin paste, then add to the cup of boiling water. If desired a little grated lemon rind may be added.

Barley Gruel.—3 heaping tablespoonfuls of barley; 1 quart water. Wash the barley, and put to cook in one quart of boiling water; boil slowly for three hours. Strain, and serve plain with a little salt, or season with cream.

Gluten Gruel.—3 tablespoonfuls prepared gluten; 1 pint of boiling water. Stir the gluten carefully into the boiling water. Boil until it thickens. Season with salt and a dessertspoonful of nut butter dissolved in water, or a little cream. The gruel may also be made with milk instead of water.

Raisin Gruel.—2 dozen raisins; 1½ pints of water. Cut and stone the raisins. Boil them twenty minutes in the water, then remove and stir in one heaping tablespoonful of wheatmeal. Boil until it thickens, stirring all the time; set back on the kitchener, and let it simmer for twenty minutes or half an hour.

Vegetable Broth.—1 cup small haricots; 1 quart water. Put the beans to cook in cold water, cook slowly until there is but a cupful of liquor remaining. Strain off the broth, add a little salt if desired, and serve hot. A little powdered thyme or strained tomato may be added as flavouring.

Tomato Gluten.—1 pint stewed strained tomato; 3 tablespoonfuls gluten. Strain and heat to boiling one pint strained stewed

tomatoes. Add the gluten carefully, letting it boil until it thickens. Season with salt to taste, together with a heaping dessertspoonful of nut butter dissolved in water, or a little sweet cream. Serve hot.

Apple Beverage.—2 apples; 1 pint boiling water. Pare and slice the apples, and put into a saucepan with a pint of boiling water. Stir slowly; when done, strain, and add a tablespoonful of sugar.

Almond Milk.—1 tablespoonful almond butter; 1 pint hot water; ½ teaspoonful white flour. Dissolve one tablespoonful of almond butter in a little of the hot water, then add to it the remainder of the water. When boiling stir in the flour rubbed smooth in a little cold water. Let it boil a few moments, then strain. Serve hot.

Raisin Beverage.—Stew raisins or sultanas slowly for some time in abundance of water. Drain off the juice, cool and serve. Flavour, if desired, with a very little lemon juice.

CHAPTER XIV.

Wholesome Combinations of Food and Balance in the Bill of Fare.

SIMPLICITY is the crowning virtue of a really well-set table, and if our meals are truly simple and composed of good materials, we shall not need to think very much about combinations. Nevertheless, it is well to be familiar with the general principles underlying the subject, since it cannot be denied that some foods in themselves quite wholesome and digestible are, when taken in combination with certain other foods, almost sure to make trouble. In other words, there is such a thing as incompatibility between foods, and while individuals with exceptionally strong digestive powers may ignore the fact, it behoves those of a less robust constitution to be more careful. Dr. J. H. Kellogg, treating this subject in his excellent work on "The Stomach: Its Disorders and How to Cure Them," gives the following table showing good, fair, and indifferent combinations:—

Good Combinations.

Cereals and fruits.	Cereals and milk.
Cereals and meat or eggs.	Cereals and vegetables.

Fair Combinations.

Cereals, sweet fruits, and milk.	Meat and vegetables.

Bad Combinations.

Fruit and vegetables. Milk and vegetables.
Milk and meat.

There is some difference of opinion as to why certain foods should be incompatible. The subject is still being investigated, and fresh light is likely to be thrown upon it at any time. It is not well to carry the matter of good combinations to an extreme, a reasonable variety of foods being an essential requirement to a good meal.

Mealy potatoes are so easily digested that there would probably be no harm in taking a little fruit at meals when they entered into the menu; but the general rule to forego fruit at a meal when vegetables are taken freely is a good one, especially for those whose digestion is weak. Sweet fruits such as dates, figs, etc., do not disagree with milk.

BALANCED BILLS OF FARE.

The question of a proper balance in the bill of fare is one that has to do with the chemical constituents of food. Aside from small quantities of various mineral salts, our daily foods contain as their chief constituents starches, fats, and proteids. The system requires these constituent elements in the daily meals, and if they are not supplied, the food, while it may be abundant in quantity and excellent in quality, will come short of properly nourishing the body. There will be a sort of unsatisfied feeling which may lead men to go to the public-house and get something to "set them up." A poorly selected, impoverished diet is without doubt the root cause of a very large amount of intemperance. In the case of children growth and development will be

retarded by such a diet, and the constitution will have feeble powers of resistance.

Amongst the working classes of England the constituent most likely to be lacking is proteid, found in abundance in haricot beans, peas, lentils, cheese, lean meat, most nuts, and to a certain extent in wheat, oatmeal, and other cereals.

The Workingman's Breakfast.

The workingman's breakfast is white bread and butter, tea, with milk and sugar, and sometimes a little marmalade. This, with slight variations, is likewise often the evening meal. The other staples are potatoes and bacon, with occasionally a little fish. All these foods, with the exception of the last, are poor in proteid, which is the most important of all the dietetic constituents, as it furnishes the material out of which tissue is built up.

How It Could Be Improved.

The judicious use of lentils, peas, and haricot beans, and the general adoption of brown bread in the place of white, would go a long way to remove this difficulty. Further, should flesh foods be used, let some other meat be chosen in preference to bacon, which is a poor proteid supplier, not to mention its unwholesomeness and liability to disease. If the money spent in beer were used to buy milk, this would also be a great gain, the curd of milk being almost pure proteid. Nuts and some of the standard nut preparations could also be used occasionally with advantage.

The following menus will fairly well illustrate the principles of a balanced bill of fare, each containing a proper proportion of the different food elements:—

Menus.

Breakfasts.

Brown Bread and Butter. Figs.
Oatmeal Porridge with Milk.
Hard Biscuits.

Fruit Toast with Grated Nuts.
Bananas and Oranges.
Brown Bread and Butter.

Milk Toast with Poached Eggs.
Dates. Nut Rolls.
Bread and Butter.

Zwieback with Nut Butter.
Brown Bread. Stewed Prunes.
Hot Milk. Sweet Oranges.

Bread and Butter. Lettuce Salad.
Sliced Lentil Roast.
Biscuits. Caramel Cereal.

Stewed Dates. Roasted Chestnuts.
Nut Rolls. Hot Milk.

Gluten Gruel. Bread and Butter.
Fresh or Stewed Fruit.

Dinners.

Tomato Soup with Croutons.
Mashed Haricot Beans.
Cauliflower with White Sauce.
Rice Pudding. Fruit.

Baked Potatoes with Brown Gravy.
Butter Bean Soup.
Plain Custard. Nut Rolls.

Rice Soup with Hard Biscuit.
Green Peas. Potatoes. Nuts.
Lentil Roast with Tomato Sauce.

Stewed Nuttose and Tomatoes.
Bread and Butter.
Steamed Fig Pudding. Fresh Fruit.

Chestnut Soup. Mashed Potatoes.
Savoury Lentils. Brown Bread.
Prune Tart.

Stuffed Vegetable Marrow.
Bean Soup. Sliced Protose.
Bread and Butter.

Teas.

Oatmeal Biscuits. Caramel Cereal.
Fresh Fruit. Bread and Butter.

Hot Milk. Stewed Prunes.
Brown Bread and Butter.

Bread and Butter. Sliced Protose.
Caramel Cereal.

Junket. Wheatmeal Biscuits.
Stewed Apples.

CHAPTER XV.

The Feeding of Infants.

THE high mortality of infancy and childhood is due almost wholly to wrong feeding. That tens of thousands of innocent little lives should be sacrificed yearly in civilised countries is a terrible blot on modern civilisation, and scarcely less than criminal. If the little ones had but half a chance, most of them would manage to survive; but, under existing conditions, the wonder is that the death-rate is not still higher.

Clean, Nourishing Food.

There are, in reality, but two very simple requirements in the case of the food which is to be given to children.

First, it must be *nourishing*, and hence digestible and suitable.

Second, it must be *clean*.

Few people, apparently, stop to consider that infants are very immature and undeveloped creatures. The stomach of an infant is materially different from that of an adult, and its ability to handle and digest food altogether inferior. These facts must receive the most careful consideration in dealing with the feeding of infants.

Articles of diet perfectly wholesome and proper for an adult, may be entirely unsuitable for an infant, and even dangerous to life. Besides, little children do not have the vitality or the power of resistance of older

people with which to combat untoward influences. They are frail, tender beings, and very susceptible to unhygienic conditions.

The Natural Diet of Infants.

This has been provided for by Nature, and it goes without saying that the mother's milk is the only perfect food for an infant. There is no doubt that a breast-fed child has great advantages over other children. The milk of a healthy mother is specially adapted to the needs of the child, and contains just the proper food elements, in the right proportion, and at the right temperature.

Under favourable conditions of health and cleanliness, the milk is sterile; that is, absolutely clean and free from microbes.

But, unfortunately, there are women who refuse to nurse their children, preferring the pleasures of society and a fashionable life to the nursery and the companionship of their little ones. The very thought is appalling and monstrous, yet it is undoubtedly true. We do not hesitate to say that a woman who is unwilling to nurse her babe because of the dictates of a vicious fashion, has no right to have children. Such conduct is anything but humane, and ought not to be possible in a civilised state.

The Hygiene of Nursing.

During the first two days there is but little milk, and the child requires only four or five feedings during the twenty-four hours. But from the third day to the end of the sixth week, there should be nine or ten feedings per day with intervals of two hours between each. Of the nine, two should be at night,

—that is between ten p.m. and six a.m. From six weeks to five months, but seven or eight feedings per diem are necessary, at intervals of two and one-half or three hours, with one feeding at night. From this time to the end of the first year, six feedings are ample, and, in some cases, five.

It is important to have a regular time for the nursing, and attend to it punctually. Either one or both breasts may be given to the child each time.

Twenty minutes is usually sufficient for one nursing.

The nipples should be carefully washed after each nursing, and kept scrupulously clean.

When to Wean.

It is a bad practice, both for the mother and the child, to continue the nursing after the twelfth month. It is well to supplement the milk with a few varieties of simple food from the eighth or ninth month, and so gradually wean the child. Gruel from strained barley or oatmeal, gluten gruel, or mild fruit juices may be given once or twice a day; in small quantities at first, and gradually increased as the child grows older.

Substitutes for Mother's Milk.

There are, of course, circumstances which may make it undesirable or even impossible for a mother to nurse her own babe, and then it becomes necessary to provide some other form of nourishment. Pulmonary consumption or other severe constitutional diseases may render nursing unwise. In all such cases a healthy wet nurse may be recommended. But too great care cannot be taken to see that the foster mother is in sound physical health and free from all taint of disease. If there is

any doubt on this score, it is better to resort to artificial feeding.

The Best Substitute.

Although there are doubtless many excellent children's foods on the market, we think it best, under ordinary circumstances, to resort to milk obtained from healthy cows. But it must not be forgotten that cow's milk is vastly different from the human product.

In the first place, the milk of a healthy woman is absolutely pure and sterile. It is drawn direct from the breast by the child, and there is no opportunity whatever for contamination.

Sources of Contamination.

It is a moot question whether cow's milk ever is, or can be, obtained pure from dairies. There is altogether too great opportunity for the introduction of germs and filth of all kinds; first, from the cow during milking; second, from the dirty hands or clothing of the milker; third, from filthy surroundings; fourth, from dirty pails, and other utensils; fifth, during transportation; sixth, in the dairy shop, where it is exposed for sale; and seventh, during delivery and while standing in the home waiting to be used. Small wonder, then, that the milk is always dirty, and more or less contaminated with germs.

Consequently, it is necessary to sterilise milk, no matter where it is obtained. This is easily done by heating in a double boiler at a temperature of 160° Fahr. for twenty minutes. This heat is sufficient to destroy all germs and render the milk safe to use, provided it comes from healthy cows. The feeding-bottle and nipple too must be carefully cleansed and

sterilised after each feeding, and kept filled with pure water until required again.

Modified Cow's Milk.

Further, cow's milk differs from human milk in composition. It contains only half as much sugar, and about three times as much proteid and salts. It is also more difficult to digest.

Cow's milk may be adapted to the requirements of the child by the addition of water, cream, and sugar. Lime water, too, should be added.

The basis for very young infants is known as ten per cent. milk. This is obtained by taking the upper third of fresh milk that has been standing in a cool place for four hours. To this is added one ounce of milk sugar, one ounce of lime water, and seventeen ounces of boiled water to every two ounces of pure milk, during the first few weeks.

Dr. Holt* recommends the following table of modifications for the first three or four months:—

	1–3 weeks.	3–6 weeks.	6–8 weeks.	8–10 weeks.	10–12 weeks.
10 per cent. milk....	2 ozs.	3 ozs.	4 ozs.	5 ozs.	6 ozs.
Milk sugar.....	1 "	1 "	1 "	1 "	1 "
Lime water.....	1 "	1 "	1 "	1 "	1 "
Boiled water.....	17 "	16 "	15 "	14 "	13 "
	†20 "	20 "	20 "	20 "	20 "

From the third or fourth month to the twelfth, seven per cent. milk, obtained by taking the upper half of fresh milk that has been standing for four hours, may be used to advantage, and the following

*"The Care and Feeding of Children."

†The milk sugar, dissolving in the water, does not increase the volume, and the quantity by measurement will be exactly twenty ounces.

table, also given by Dr. Holt will indicate the constitution of the modified milk:—

	4th month.	5th month.	6th, 7th months.	8th, 9th months.	10th–12th months.
7 per cent. milk.....	7 ozs.	8 ozs.	9 ozs.	10 ozs.	11 ozs.
Milk sugar.....	1 "	1 "	1 "	¾ "	¾ "
Lime water.....	1 "	1 "	1 "	1 "	1 "
Boiled water.....	12 "	11 "	10 "	5 "	3 "
Barley gruel.....	0 "	0 "	0 "	4 "	5 "
	*20 "	20 "	20 "	20 "	20 "

We add still another table from Dr. Holt's excellent book to indicate the quantity to be given at each feeding, as well as the number of feedings each twenty-four hours:—

	1 No. of hrs. interval between meals by day.	2 Night feedings, 10 p.m. to 7 a.m.	3 No. of feedings in 24 hours.	4 Quantity in ozs. for one feeding.	5 Quantity in ozs. for 24 hours.
2nd to 7th day.....	2	2	10	1 –1½	10–15
2nd and 3rd weeks.	2	2	10	1½–3	15–30
4th and 5th "	2	2	10	2½–3½	25–35
6th wk. to 3rd mo..	2½	1	8	3 –5	24–40
3rd to 5th month...	3	1	7	4 –6	28–42
5th to 9th " ...	3	0	6	5 –7½	30–45
9th to 12th " ...	4	0	5	7 –9	43–45

It is well to bear in mind that infants get thirsty as well as older people, and, instead of offering the breast or bottle every time a child cries, a few teaspoonfuls of pure water should be given occasionally.

A More Liberal Diet.

This is a problem to be solved thoughtfully and with special attention to each individual case. It is necessary to study the child to understand its physical con-

*See note on previous page.

dition, and thus be able intelligently to anticipate its wants.

As the child grows older and stronger, various wholesome foods may be added to advantage. But it is dangerous to begin too soon, and, in most cases, it is best to wait until the eighth or ninth month. The pure juice of mild ripe fruits can usually be given to a child of six to twelve months or more with perfect safety. But, even in the case of fruit, one should begin carefully and with a very small quantity, noting the effect upon the child. Later, banana puree, prepared from ripe bananas, baked apples, fresh, scraped apple, stewed prune puree, and other preparations of fruit, may be added to advantage.

After reaching twelve months, a mealy potato, good bread and butter, well-cooked porridge, and other varieties of plain, wholesome food, can safely be used.

After the twelfth month, four meals are ample for healthy children, and by the second or third year three meals are sufficient for most children.

Some Don'ts.

Don't give a child stout, beer, or any form of alcoholic beverage, tea, coffee, spices, condiments, sweetmeats, ice-cream, cakes, pastries, pickles, cheese, canned salmon, shell-fish, oysters, or indeed any food that would be difficult of digestion, or otherwise harmful.

Unripe fruit is especially to be guarded against, also that which is over-ripe. Little children are naturally fond of fruit and cannot be trusted to choose what is good. A very large percentage of infant mortality is owing to lack of careful parental supervision of what goes into the little one's stomach.

In our opinion, it is unwise to feed an infant or young child on flesh meats of any kind. Children do best on a diet of plain, non-stimulating food, and it is very undesirable to awaken in them, while their appetites are pure and innocent, a desire or a craving for stimulants. This is often the result when flesh foods, condiments, and hot sauces are given to children. The craving, slight and hardly recognised at first, grows, and may finally develop into an uncontrollable thirst for strong drink.

CHAPTER XVI.

The Feeding of School-Children.

NOTHING is more important in the development of strong, healthy children than the food which is daily set before them. The problem of the nation's feeding has chiefly two phases; relating, on the one hand, to the feeding or the lack of feeding of that very large portion of the labouring class which barely manages to make ends meet, and on the other to the comfortably placed, or wealthy. No doubt the children of the poor suffer the most, being kept in a state of semi-starvation; but the pampered children of the higher classes, fed on highly-seasoned meats two or three times a day, in the hope that they will thereby grow strong, are by no means to be envied.

Anæmic Boys.

Look at these sons of well-to-do families as they file out of some high-class school. Are not pale, pinched faces and stooping shoulders remarkably frequent? Is there not a general appearance of weakness and delicacy, an absence of clear, bright eyes, and rosy cheeks, and boyish vim and vigour? The trouble is that they are anæmic, and that mainly because they are improperly fed. Too much meat is their portion, too little porridge and milk, and wholesome fruit such as every boy loves. The food supplied them while undergoing severe mental training, and at the same time passing through the most critical period

of their lives physically, is in the main ill-selected and but poorly prepared.

Food that Irritates.

Meat two or three times a day means an excess of proteids, which on being assimilated, both clog the system and disturb the delicate nervous mechanism, thus leading often to impure habits. Moreover, the animal extractives contained in meats are themselves nerve irritants. It seems strange that parents should pray for the purity of their children, and then feed them on a diet which is bound to develop abnormally the animal passions, and thus tend directly to impurity.

The Food that Gives Strength.

But it all comes from the mistaken idea that boys must eat meat to become strong, and the more meat they eat, the stronger they will become. This supposed fact is pure fiction. The food that will make boys strong is the food that naturally belongs to them—plenty of good brown bread and milk, fruits, nuts, and vegetables. Bread, well made, thoroughly baked, with plenty of crust, should be the mainstay of our children. It was on bread with oil and cresses that the ancient Persian youths developed strong, lithe bodies, and became dexterous in all manly sports. It was on barley bread, olives, and figs that the Greeks brought up their boys and trained them for the Olympian games. No nation has ever developed finer bodies than the ancient Greeks, and no nation ever lived more abstemiously than they at the time of their greatest triumphs. Spartan simplicity has come to be proverbial with us. Perhaps nothing would do more for the health of young England than a genuine revival of simple, wholesome habits of eating.

Labourers' Children Underfed.

To return now to the children of the labouring classes, we have said that their difficulty is underfeeding. Often this is true in quantity; they cannot get *enough* even of the poor food that falls to their lot. This is the case, however, only amongst the very poorest, where families are usually large and wages low, and for the most part further depleted by the outlay for drink.

Doubtless the largest class of labourers' children suffer from underfeeding of another kind. They get enough of the food such as it is, but the quality is poor, and the selection not the best. Consequently the children do not properly develop. They are undersized, pale, and sickly, when on a proper diet they would be hearty, strong, and vigorous.

John Burns on Cookery.

The children of the poor lack what their well-off neighbours get far too much of—proteid. White bread and strong stewed tea, with bacon and potatoes, form the basis of the diet of the working classes. Other foods are thrown in for variety, but these are the staples, and they are all decidedly lacking in proteid. What is needed is an intelligent use of legumes and nuts, and of good brown bread. There must be some variety in the meals; a little more real cookery would be a boon to the working classes. We quite agree with Mr. John Burns, M.P., who, on being recently asked what the labouring man most needed, replied: "Wives that can cook." We do not mean that there is a demand for more highly seasoned "made dishes," and pies, and heavy puddings and cakes; such delicacies

are better not prepared at all; but more plain, wholesome cookery of a nature to make food more digestible, and hence better suited to the needs of the system.

Simple Foods for Old and Young.

"What would you have us give our children?" we imagine a chorus of women demanding. Feed them on simple, natural foods, containing all the elements of body building, in the right proportions. In fact, if the adult members of the family would give up unwholesome things, and eat and drink only what would be for their good, it would be quite safe for them to feed their children much the same as they eat themselves.

Model Breakfasts.

For breakfast children should have well-made porridge cooked not less than an hour, and milk, with some hard wholemeal biscuits or zwieback to eat with it to encourage proper mastication. A few dates would be a pleasing addition to the meal. Some mornings they may have for a change simply brown bread and butter and fresh fruit, as apples, plums, cherries, etc. They should not be stinted as to the amount, but should be encouraged to eat slowly and masticate well.

Fruit toasts are another excellent breakfast dish for children: so also are toasted wheat flakes, with milk or fruit juice, or taken dry; plain bread and milk; and oatmeal or gluten gruel made with milk.

Value of Hard Foods.

One of the substitutes for coffee with plenty of milk and a little sugar is allowable, but we would not encourage the large use of warm drinks. Chil-

dren should learn to do their drinking between meals. The bread given them should be well baked, and the more zwieback they eat, the better. The teeth must be used if they are to be kept in a healthy condition, and youth is the best time to cultivate a love for hard things, and the practice of thoroughly chewing all the food taken into the mouth. This habit, once acquired, would most likely cure fully half the dyspeptics, for whom an army of regular physicians, and an ever-increasing army of patent medicine makers and vendors cater in vain.

No Eating Between Meals.

Now we come to dinner. First, let us say a word about eating between meals. The habit is a pernicious one, and should not be allowed even in very young children. If it is thought best to feed a child four times a day, let that be the rule, but on no account let the child be eating at all hours. In very few cases will there be any occasion for feeding children more than three regular meals, however, and the last meal of the day ought to be very light and simple in character, and be taken at least two hours before retiring. Failure to insist on this important rule will be sure to lead to dreams, night terrors, and disturbed sleep generally.

Model Dinners.

What, then, shall we give our children for dinner? Still plenty of good brown bread, a little potato with plain white sauce, one of the muscle-building foods to be found in the recipe department of this book, and perhaps a dish of rice pudding for dessert. But the latter is not necessary. Bread with potatoes and gravy,

and a few nuts to crack for dessert, will do very well. At other times make for them a good haricot bean soup (cook the beans slowly till they are tender, and if you can spare the time, rub through a colander to remove the tough skins) with zwieback to crumb into it, and a couple of slices of bread and butter, followed by an apple or two. Lentil soup, also given in our recipe department, can be made in a few minutes, and will be found excellent for growing children. At other times a very good midday meal might consist of rice soup made with milk and rather thick, eaten together with some kind of hard bread, followed by nuts and a little mild fruit.

What to Give Children for Tea.

A bowl of bread and milk makes an excellent tea. A slice or two of bread and butter without milk also does very well. We do not recommend jam for children, believing sweet fruits, such as raisins, sultanas, dates, and figs, to be more natural and wholesome articles of diet. Much of the jam and marmalade on the market is manufactured under questionable conditions, making it wholly unfit for food, and the excessive use of cane sugar is always fraught with danger to the digestion.

We have recommended brown bread, but it should not be of the coarsest. The advantage of the finer-ground varieties over the coarse meals is that the proteid they contain is more completely assimilated by the system. Brown bread is superior to white bread as containing a larger amount of proteids and salts, both of which are of the greatest importance to growing children.

Objectionable Flesh Foods.

Meat does not seem to us an ideal food for either adults or children; its objectionable features have been discussed somewhat fully elsewhere. Some kinds of flesh food are for various reasons specially objectionable, and should never be given to children. Pork in all forms may well be omitted from the diet of both children and adults, being the flesh of an animal of very unclean habits and subject to many diseases. It is also more difficult of digestion than most other animal foods. Oysters and shell-fish of all kinds are poor in nutriment, and very liable to sewage infection, numerous epidemics of typhoid fever having been traced to their use.

Eggs are useful in cooking, and in the case of delicate children, requiring a specially generous dietary, soft boiled eggs, or raw whipped eggs have been found valuable.

Prevalent Errors of Feeding.

A few very prevalent errors may be noted in conclusion. Don't give children highly seasoned food; be very sparing even in the use of salt, and never initiate them in the use of such highly irritating condiments as pepper, mustard, vinegar, and the like. Bland, simple flavours are the wholesome ones, and it is the work of the skilful cook not to introduce hot, violent condiments, but to bring out the natural flavours of foods so that they will be most palatable.

Sweetmeats would best be tabooed. Even if they were not unwholesome, which they really are, they would be objectionable as being universally regarded in the light of things to tickle the palate rather than as necessary food. There is far too much of this kind

of intemperance abroad already. Thousands of people have made shipwreck of their lives through not being able to control a perverted appetite. Giving children "knick-knacks" of any sort tends to encourage them to look on palate pleasure as something to be sought in itself, whereas they ought to be educated to eat "for strength," and not merely to please appetite.

Avoid Harmful Confectionery.

It may seem hardly necessary to warn mothers who care for their children's welfare not to let them spend their pennies for the highly coloured cakes and other unwholesome products of the confectioner's shop, or the enticing wares of the ice-cream vendor. Serious illness has often occurred through indulgence in such questionable luxuries. Plain food is the best for old and young, and there is not so much risk about it.

Sausages, those "skin-stuffed compounds of unknown origin," should never be given to children. Tinned salmon and tinned meats of various kinds are also highly unsuitable foods, even if their use were not fraught with serious danger owing to the virulent poisons such articles sometimes contain. Corned beef and pickled fish are extremely difficult of digestion, and should never be set before children. Lard and dripping are inferior for shortening to cocoanut butter. Margarine is often given to children, but it is not to be recommended, good dairy butter or one of the nut butters being far superior.

Care in Selecting Foods.

If children are to have meat at all, let it be a small quantity once or twice a week of the very best. See that it is of firm texture, has the right colour;

and a healthy appearance generally. Much of the meat sold is in a state of advanced decomposition. Fowls need to be selected with special care. Fresh fish, baked or boiled, is fairly easy of digestion and less likely to injure children than meats; but except in coast towns, it is difficult to procure it in a proper condition. Fish that is not perfectly fresh is likely to cause serious trouble. The fish sold ready cooked from the fried fish shops must be regarded with suspicion.

We have been able to deal with our subject only in a somewhat general way, but the principles laid down in this chapter, if carefully studied and applied intelligently, should aid any mother in setting before her children that which will make for sound bodies and pure minds, and by satisfying all the needs of the system leave little room for the acquirement of the stimulant appetite.

CHAPTER XVII.

The Place of Fruits and Nuts in a Healthful Dietary.

THE gods fed on apples, according to an old Scandinavian myth, and the idea has prevailed for centuries back that fruit is a form of food possessing peculiar advantages. There is undoubtedly a strong natural craving for it in children. Sailors at sea feel the need of it, and eagerly embrace the opportunity when touching at the tropical ports of supplying themselves with the fruits that grow so abundantly in those parts.

Man's Natural Diet.

Anatomically, fruits and nuts would seem to be man's chief natural diet as they are that of the higher apes, which most nearly resemble the human being. Certainly good, ripe fruit can often be taken when the stomach rejects everything else. Even infants are usually able to take fruit juice without harm, while a large class of invalids appear to derive great benefit from the grape cure. Subsisting solely on fruit of various kinds is an excellent means of recovery from certain abnormal disease conditions.

Fruits are not as a class noted for their nutritive value, being largely composed of water, as the following table will show:—

	Water.	Proteid.	Carbohydr'ts.	Ash.	Cellulose.	Acids.
Apples	82.5	0.4	12.5	0.4	2.7	1.0
" (dried)	36.2	1.4	49.1	1.8	4.9	3.6
Pears	83.9	0.4	11.5	0.4	3.1	0.1
‡Apricots	85.0	1.1	12.4	0.5		1.0
Peaches	88.8	0.5	5.8	0.6	3.4	0.7
Plums	78.4	1.0	14.8	0.5	4.3	1.0
Cherries	84.0	0.8	10.0	0.6	3.8	*1.0–1.5
Gooseberries	86.0	0.4	8.9	0.5	2.7	1.5
†Currants	85.2	0.4	7.9	0.5	4.6	1.4
Strawberries	89.1	1.0	6.3	0.7	2.2	1.0–1.2
Blackberries	88.9	0.9	2.3	0.6	5.2	
Raspberries	84.4	1.0	5.2	0.6	7.4	1.4
Cranberries	86.5	0.5	3.9	0.2	6.2	2.0–2.5
Grapes	79.0	1.0	15.5	0.5	2.5	0.5
Melons	89.8	0.7	7.6	0.6	1.0	
Bananas	74.0	1.5	22.9	0.9	0.2	
Oranges	86.7	0.9	8.7	0.6	1.5	1.1–2.5
‡Pineapples	89.3	0.4	9.7	0.3		
Dates (dried)	20.8	4.4	65.7	1.5	5.5	
Figs (dried)	20.0	5.5	62.8	2.3	7.3	1.2
‡Prunes (dried)	26.4	2.4	66.2	1.5		2.7
Currants (dried)	27.9	1.2	64.0	2.2	1.7	
‡Raisins	14.0	2.5	74.7	4.1		

*Stutzer. †Red, black and white. ‡Cellulose included with Carbohydrates.
This table does not indicate the amount of ether extract in various fruits, which runs from nothing to as high as 3 per cent. Hence some of the values do not total 100.

By far the most abundant food element in fruits is seen to be the carbohydrate group, from one-half to three-quarters of which will usually consist of sugar. Levulose is the chemical name given to this fruit sugar, which is taken into the system without requiring to be changed by the digestive fluids, and is therefore of peculiar value in wasting diseases.

It will be seen that our common fruits are rich in carbohydrates. A pound of apples contains 12.5 per cent. of this food element, or nearly one-half the total nutriment in a pound of meat; a pound of bananas with its 25 per cent. nutriment lacks only 2 per cent. of equalling the nutriment in a pound of meat, though, of course, the latter contains much the



Preserving Fruit for Winter Use.

picked long before they are ripe, and the result is that such fruits as strawberries, cherries, plums, melons, bananas, etc., are often fibrous, tough, and strongly acid products, quite the opposite of what they would have been if left on the stem to ripen in the natural way. It is hardly necessary to say that such fruit should be cooked rather than eaten raw. Doubtless much of the widely-existing prejudice against fruit as being difficult of digestion is due to partaking of it while in this unfit condition.

How to Preserve Fruit.

Fruit may be put up for winter use in hermetically sealed glass jars. The process is a simple one, and easily learned.* The opinion occasionally advanced that summer fruits are not in season at any other time of the year, and therefore it is unnatural and contrary to the laws of health to put them up in this form for use in winter, is hardly well grounded. The fact is that the cold climate is itself unnatural to man, who properly belongs to the tropics, but it is just as

*The following instructions are adapted from Mrs. E. E. Kellogg's book, "Every-day Dishes." Sterilise jars, covers, and rings by letting them remain a short time in boiling water. Cleanse the fruit thoroughly by washing in plenty of water, and cook slowly in an enamelled saucepan, using only a small amount of water. Fifteen minutes may be considered as the shortest time for which even the most delicate fruits should be subjected to the temperature of boiling water, and at least thirty minutes will be required by most fruits. The boiling should be very slow however, as hard, rapid boiling will break up the fruit, and much of its fine flavour will be lost in the steam. Use the best sugar, if any; two tablespoonfuls to a quart of fruit is sufficient for most sub-acid fruits; plums, cherries, strawberries, and currants require more.

When everything is in readiness, the fruit properly cooked, and at boiling temperature, fill the jar (which has just been sterilised with boiling water) to overflowing with the hot fruit, and laying the rubber ring in place, screw on the cover at once. When cool, tighten the cover by further screwing. Put in a cool place, bottom upward, and watch closely for a day or two. If the juice begins to leak out, or any appearance of fermentation is seen, it is a sign that there has been some failure, and the jar should be opened immediately, and the contents thoroughly boiled and used as quickly as possible. If no signs of spoiling are observed, the fruit may be safely stowed away in a cool, dark place, and will keep for years. [The Mason jar is perhaps the most easily managed, though other makes will do very well.]

reasonable that he should preserve plums, and cherries, and currants, and other pleasant summer fruits for winter use as that he should store up grain and vegetables for the same purpose. Probably there would be fewer complaints of spring biliousness if people ate more freely of fruit during the winter season.

Jam as a Food.

It is well to remember that fruit preserved in the form of jams, even supposing the jam of commerce to be a pure article, is still not by any means an ideal food. It may rather be considered as a sweetmeat, which healthy people may perhaps take occasionally, but which is too rich in cane sugar to be a safe food for invalids. The free use of these concentrated sweets is a prolific cause of indigestion.

Fruits of all kinds need to be carefully cleansed with abundance of pure water before serving. Apples and bananas should be carefully wiped with a damp cloth. These precautions should invariably be observed, since the pickers are very often careless in their habits, and the conditions under which such fruits as bananas are stored and ripened are not always the most desirable.

Nuts and Brain Work.

In these days of severe brain work, nuts are rapidly coming to the front as containing in the purest and (when properly chewed or otherwise prepared) most digestible form the proteids which are so essential to the maintenance of the highest mental vigour.

Following is a table showing the composition of some of the most common nuts:—

	Water.	Proteid.	Fats.	Carbo-hydr's.	Cellu-lose.	Miner'l Matter.
Chestnuts (fresh)	38.5	6.6	8.0	45.2		1.7
" (dried)	5.8	10.1	10.0	71.4		2.7
Walnuts (fresh)	44.5	12.0	31.6	9.4	0.8	1.7
" (dried)	4.6	15.6	62.6	7.4	7.8	2.0
Filberts and hazels (fresh)	48.0	8.0	28.5	11.5	2.5	1.5
" " " (dried)	3.7	14.9	66.4	9.7	3.2	1.8
Sweet almonds	6.0	24.0	54.0	10.0	3.0	3.0
Pistachio kernels	7.4	21.7	51.1	14.0	2.5	3.3
Cocoanut (fleshy part)	46.6	5.2	35.9	8.4	2.9	1.0
" (dried)	3.5	6.0	57.4	31.8		1.3
" (milk)	90.3	0.5		9.0		

Chestnuts, which contain less proteid and a larger proportion of the carbohydrates than other nuts, are the mainstay of the poorer peasantry of central France and parts of Italy. Hutchison mentions their cheapness, and says that "a given area of ground produces the maximum amount of human food when planted with chestnut trees."

Almonds.

Sweet almonds are the richest in proteid. They are best prepared by blanching, and roasting in the oven till of a light straw colour, when they will be found crisp and toothsome, and very digestible, besides being remarkably sustaining. "No man," someone has said, "need starve on a journey who can fill his waistcoat pocket with almonds." For people of sedentary habits almonds form a well-nigh perfect food, combining easy digestibility with abundant nutrition.

Thorough mastication is essential in the case of all nuts. Those who have poor teeth would probably do wisely to take nuts in the form of some of the prepared nut butters or other preparations; since raw nuts incompletely chewed are very likely to prove difficult of digestion.

When to Eat Nuts.

Nuts should never be eaten between meals or late at night. They are concentrated foods, and should be taken as part of a regular meal. Fortunately they combine well with practically all other foods, and thus fit nicely into breakfast, dinner, or supper. A handful of nuts eaten with brown bread will supply both the proteids and the fat in which the bread is slightly deficient.

Nut butters and nut oils are also valuable foods, which bid fair largely to take the place of animal fats in the near future.

CHAPTER XVIII.

"Nature's Food Filter,"

or

THE NEW SYSTEM OF THOROUGH MASTICATION.

"MASTICATE thoroughly" has been a common expression with physicians for many years; but usually it has not meant very much. Mr. Horace Fletcher has reduced chewing to a fine art, and his system has benefited so many, and withal appeals so strongly to one's common sense, that it calls for some consideration in a work on health culture. For a complete setting forth of the matter the reader must be referred to Mr. Fletcher's unique and thoroughly interesting books, containing along with the writer's account of his own experiments a number of corroborative letters from friends and collaborators.

Origin of Fletcherising.

The author of the system, who is an American residing for the most part abroad, began his experiments in the summer of 1898. He was then afflicted with "over-robustness" (weighing 205 lbs. in summer clothing), and suffered from various allied disorders, of a sufficiently grave character to render him ineligible for life insurance. It was with a view to improving his own condition healthwise that he entered upon his investigations. What led him to give special attention

to mastication we do not know; but the system of eating that he adopted for himself, and which he is devoting his life to expound to others, consists in the use of what he appropriately calls "Nature's Food Filter," a cultivable instinct that does not allow of the swallowing of food of any sort till thorough mastication has deprived it of all its flavours, and reduced it to a fine liquid. In brief, to "Fletcherise" is to hold a morsel of food in the mouth as long as you can, letting it pass on naturally for the most part by unconscious swallowing. Any tough, stringy, indigestible matter which may still remain in the mouth is then rejected. The rule applies to liquids as well as to solids, everything that has taste has to be chewed—enjoyed as long as the taste remains. Water only is to be drunk, as being tasteless. "Don't drink soup! Don't drink milk!" we are told; sip everything that has taste, so that taste can inspect it and get the good out of it for you."

As a first result of following this plan of taking food, Mr. Fletcher found that his appetite was fully appeased with less than half the amount of food he had been in the habit of taking. Moreover, his weight decreased in three months from 205 lbs. to 163 lbs., while his strength very materially increased, and with it came a sense of youthful freshness and well-being to which he had been a complete stranger.

Experiments at Cambridge University.

Not satisfied with experimenting upon himself, the discoverer of Nature's Food Filter sought the professional knowledge of physiologists and physicians. Some careful experiments were made in Cambridge University,

concerning the results of which the eminent physiologist, Sir Michael Foster, M.P., penned a brief report, from which we take a few extracts:—

"Certain facts were established by these observations which, however, are to be looked upon as still of a preliminary nature. The adoption of the habit of thorough insalivation of the food was found in a consensus of opinion to have an immediate and very striking effect upon appetite, making this more discriminating, and leading to the choice of a simple dietary and in particular reducing the craving for flesh foods. The appetite, too, is beyond all question fully satisfied with a dietary considerably less in amount than with ordinary habits is demanded. In two individuals who pushed the method to its limits, it was found that complete bodily efficiency was maintained for some weeks upon a dietary which had a total energy value of less than one-half of that usually taken, and comprised little more than one-third of the proteid consumed by the average man.

Increased Working Powers.

"All subjects of the experiments who applied the principles intelligently agreed in finding a very marked reduction in their needs, and experienced an increase in their sense of well being, and an increase in their working powers.

"One fact fully confirmed by the Cambridge observations consists in the effect of the special habits described upon the waste products of the bowels. These are greatly reduced in amount, as might be expected; but they are also markedly changed in character, becoming odourless and inoffensive, and assuming a condition which suggests that the intestine is in a healthier and

more aseptic condition than is the case under ordinary circumstances."

Similar, though more complete, experiments were made in America by Professor Russell H. Chittenden, President of the American Physiological Society, the report of which is too lengthy for quotation here. The subject is still receiving careful study by some of the world's leading physiologists, and thus far every new ray of light thrown upon it confirms the truth of the claims that have been put forth.

Mr. Fletcher as a Cyclist.

If it be thought that living on half the ordinary rations must necessarily cause weakness, it may be answered that Mr. Fletcher on his 50th birthday took a bicycle ride of 304 *kilometres*. This is not bad for a man who was refused life insurance only a few years ago. The other individuals who have adopted the system all report increased strength and powers of endurance.

Mr. Fletcher, it may be said in passing, is in sympathy with vegetarian principles. "Much meat," he says in a recent publication, "excites lust, intemperance, and savagery in man, and gives explosive, non-enduring force. We know that it tends to shorten life and predispose to disease." The effect of thorough mastication, he also tells us, is to make one revert more and more to simple, natural foods of mild flavours.

Mental Side of Chewing Reform.

The new reform has a mental as well as a physical side. "Fletcherising," we are told by its author, does not consist "only and merely of careful chewing, . . . cheerfulness is as important as chewing; and if persons

cannot be cheerful during a meal, they had better not eat. Not eating will not hurt them in the least, but lack of cheerfulness will defeat the object of the meal by causing more or less indigestion."

The author rather uniquely sums up his advice in the words: "Don't chew anything when you are mad, or when you are sad, but only when you are glad that you are alive, and glad that you have the appetite of a live person, and one that is well earned."

Time Required for Meals.

The amount of time actually required for this perfect mastication is not nearly so great as one would think. Mr. Fletcher eats but two meals daily, and finds forty-five minutes' actual chewing abundantly sufficient for both. When one considers the great saving of energy farther on in the digestive tract which this system effects —the absolute freedom from ordinary digestive disorders which it seems to confer on its followers, one could hardly begrudge the spending even of considerable extra time in giving it a thorough trial.

Evidently the subject is one of great importance from the economic standpoint. If men are eating double the amount of food that they really need, it is reasonable to believe that a great deal of nerve energy which might be utilised in useful mental or physical labour, is expended in ridding the system of the surplus nutrition.

In conclusion we heartily commend the idea to our readers; especially should the large number sure to be suffering from digestive disorders give it a thorough trial.

CHAPTER XIX.

Popular Beverages: Their Possible Effect on the Health.

TEA.

OF all popular warm beverages, tea undoubtedly heads the list in Great Britain, about 4,000,000 gallons being consumed daily in these islands. The yearly consumption of tea works out at six pounds per head of the population. Only in Australia, where tea is so generally used in the Bush, is this amount exceeded.

Contents of a Cup of Tea.

What does tea contain to make it such a well-nigh universal beverage? Following are the chief chemical constituents of two typical varieties of the plant:—

	BLACK TEA.	GREEN TEA.
Water	8.20	5.96
Caffeine	3.24	2.33
Alcoholic extract	6.79	7.05
Tannic acid	16.40	27.14
Cellulose	34.00	25.90

These are all the essential ingredients* of a cup of tea. In fact, the caffeine, alcoholic extract or volatile oil, and tannic acid are the only important constituents; they give the beverage both its characteristic flavour and its peculiar properties. Needless to say, tea has no

*Tea also contains sixteen or seventeen per cent. of insoluble albumin, about four per cent. of chlorophyll and resin, and other substances of interest only to the chemist.

food value worth considering aside from the sugar and cream that are usually added at the time of serving.

The nation is using year by year a larger amount of tea. In many families it is taken three or four times a day, and in considerable quantities. Under these circumstances we may well raise the inquiry whether such a wide use of what must be considered as a drug rather than as a food, is wholesome. How, then, does tea affect the human body?

Effect of Tea on Digestion.

Chiefly in two ways. First, the tannic acid it contains has been found, by careful experiments conducted by Dr. Roberts, a well-known authority on physiology, to interfere decidedly with the conversion of starch into sugar by the saliva. In other words, tea taken at meals along with bread and butter hinders the proper digestion of the bread and any other cereal food. Dr. Fraser has made elaborate investigations going to show that tea also interferes with the digestion of proteids, which takes place in the stomach. He attributes this partly to the tannin, and partly to the other ingredients. This retarding of the digestive process naturally favours fermentation and the forming of poisonous by-products in the alimentary canal. To persons of weak digestive powers it may make all the difference between a state of comfort and well-being and one of decided discomfort in the digestion of a meal.

The tannic acid also affects the delicate lining membrane of the stomach, being a powerful astringent. Hence, if taken entirely apart from meals, the beverage would still be injurious to the digestive organs. So much for the effect of the tannic acid.

How Tea Affects the Nervous System.

We now come to consider the nature of the caffeine and volatile oil. Quoting from Hutchison, "Caffeine, like alcohol, is a stimulant, but unlike that substance, it exerts its effects upon the central nervous system even more than upon the heart. . . . It removes the sense of fatigue, and is apt to produce sleeplessness."*

An Eastern Legend.

The ancients fully understood the action of tea. Tradition has it, writes Dr. Hutchison, that in the remote ages, there was a holy Asiatic, Prince Darma, who spent his nights in meditation on the Infinite. One night his ecstasy was disturbed by sleep. On waking, he was so enraged at his weakness that he cut off his eyelids, and flung them on the ground. On visiting the spot some time later, he found that where each eyelid fell, a small shrub had grown up. He infused the leaves of the shrub, and ever afterwards, by simply drinking some of the infusion he was able to keep sleep at bay. That shrub was the tea plant!

The Cumulative Effect of Tea.

In estimating the injury done to health by tea-drinking, allowance must be made for individual peculiarities; some persons are more affected than others. But the daily use of the drug, even in small doses, can hardly fail to have a cumulative effect for evil upon the human system. Artificial stimulants of any kind are not safe, for they always have their time of reaction. Unnatural excitement is followed by an equally unnatural depression. Persons of nervous temperament

*"Food and Dietetics."

are likely to suffer most severely from the use of tea. Among the evil results that may ensue upon a free indulgence in tea, Dr. Hutchison mentions the following:—

May Cause General Nervousness.

"The increased excitability of the nervous system which they [tea and coffee] produce may lead to general 'nervousness' (the patient starts, for instance, on the slightest sudden noise, or, as a tea-taster once put it to the writer, he becomes 'jumpy'), tremulousness, palpitation, loss of sleep, giddiness and depression. . . . The dyspepsia which results is of the atonic type, digestion being slow, often accompanied by flatulence, and attended by a feeling of sinking or depression and disturbance of the heart's action."

Tea and Physical Deterioration.

Some other physicians who have studied the effects of tea take a stronger stand against it than does Dr. Hutchison. Several medical men have recently expressed it as their view that the physical deterioration seen in certain directions is due largely to the adoption on the part of the labouring classes of tea, mostly in a strong form, as a daily beverage. White bread and butter and strong, stewed tea seem to be the staples in many homes, and certainly afford a very unsatisfactory diet. Many attribute the growth of nervous diseases and disorders of digestion largely to the wide use made of this beverage.

It need hardly be said that the longer tea is infused, the more of the harmful ingredients it will contain. But this applies specially to the tannic acid. The volatile oil and the caffeine, which are the ingredients chiefly

affecting the nervous system, dissolve out almost immediately upon the addition of boiling water.

Harmless Substitutes.

Several harmless substitutes for tea have been proposed, and may do very well for a warm drink; but it is just as well to remember that the large use of liquids at meals is not physiological. Good, well-made porridge and milk with some hard bread would make a better warm dish for breakfast than bread and butter washed down with any sort of beverage. The copious use of hot drinks at meals is likely to cause a relaxed condition of the digestive organs; it also interferes with the proper chewing of the food, a matter of the utmost importance in maintaining the health of the digestive system.

COFFEE.

Coffee is another popular beverage, but one not nearly so common in Great Britain as in America and on the Continent. In composition it strongly resembles tea, containing a trifle more than one per cent. of caffeine, eight to nine per cent. of caffeic acids, four to six per cent. alcoholic extracts, and some other unimportant ingredients. Its effect on the digestion seems to be less decisive than that of tea, there being no tannic acid; but the nervous system is affected by strong coffee in much the same way as by tea. Both beverages seem to have a definite stimulating effect. People learn to grow very fond of them, and cannot readily break off their use, which shows that they do not belong to a natural dietary.

Tea and Coffee Compared.

For persons suffering with flatulence, coffee is believed to be less injurious than tea. In a case of chronic catarrh of the stomach, it may prove the more troublesome of the two, though neither could be recommended. Of course, coffee is like tea in having no food value. The money spent upon it is wasted so far as nutrition is concerned.

COCOA.

Cocoa has some excuse for its use as a beverage, being possessed of a certain food value. The best cocoas contain from twenty-five to thirty-three per cent. of nitrogenous matter. There is also a small quantity of starch. The only objectionable element in cocoa is the one to two per cent. of *theobromine* it contains. Certainly it has none of the fascinating effects commonly attributed to tea and coffee, and there can hardly be said to be any such thing as the "cocoa habit." However, the considerable percentage of fat makes cocoa unsuitable for some persons who are troubled with weak digestion, and perhaps inclined to biliousness, more especially as the fat of cocoa is peculiarly difficult of digestion.

Is Cocoa a Brain Stimulant?

It has been claimed for cocoa that it is a valuable stimulant for brain workers; but Hutchison tells us that whatever stimulating effect it may have is so exceedingly mild as to be negligible, and this would seem to be the opinion of medical men generally, who often deny their patients tea and coffee because of the stimulating properties of these beverages, but allow them to use cocoa.

Chief Value of Cocoa.

The chief value of cocoa to brain workers would consist in the fact that made with milk in the form ordinarily called chocolate, it affords a drink of considerable nutritive value, which imparts strength to the system in the form of food. No doubt milk alone would be equally good, and in some cases better.

Cocoa is becoming more popular year by year. To the extent that it is taking the place of alcoholic beverages and stronger narcotics such as tea and coffee, it may be said to be doing good, even though in itself it is not possessed of any great value.

CHAPTER XX.

The Smoking Habit Physiologically Considered.

THE smoking habit has a large following in Great Britain, this nation spending at the present time about £25,000,000 annually on the weed. What is the nature of this habit, which is costing us as much as our daily bread? Does tobacco satisfy a natural want? Is the consumer benefited by the indulgence? Or is it an injury to him? and if so, in what respect? These are a few of the questions we shall attempt to answer in the following pages.

Tobacco consists of the prepared leaves of a plant known as the *Nicotiana Tabacum*, of the botanical order of Solaneæ, and nearly related to the deadly nightshade, the lobelia, foxglove, and other poisonous plants.

Composition of Tobacco-Smoke.

The ingredients of tobacco-smoke are: (1) Prussic acid, a deadly poison, too well known to need further description. (2) Carbonic acid gas (about five per cent). (3) An oily substance of such deadly character that a drop placed on the tongue of a snake causes immediate death. (4) Nicotine, an alkaloid known to be one of the most virulent poisons in existence, one-tenth of a grain of which is sufficient to kill a fair-sized dog. These constituents, together with a trace of sulphuretted hydrogen, and other

deleterious gases, a trifling amount of carbon, and a very little water in the form of vapour make up the chemical sum total of tobacco-smoke, for which this country is paying £25,000,000 annually.

When Smoking Was Introduced.

Tobacco was first introduced into Europe about four hundred years ago; but the habit did not become generally known till a hundred years later, Sir Walter Raleigh helping to popularise it in England. Jean Nicot, a Portuguese, introduced it into France, and gave his name to its characteristic constituent, *nicotine*. The habit was violently opposed by those in high authority, notably James I. of England, the Czar of all the Russias, the Shah of Persia, and Pope Urban VIII., the latter pronouncing tobacco an "accursed thing." Moreover, severe punishments were meted out to the offenders. Many were scourged, some had their noses cut off; even the death penalty was threatened against the obdurate smoker. Moral suasion was also used, upwards of a hundred books being written to set forth the exceeding harmfulness of so unnatural a habit.

Still the evil grew apace. Even the thundering invectives of James I. availed nothing in the face of such a craze for smoke, although his famous "Counterblaste of Tobacco" remains a classic of its kind. Was he not right in saying, "He that taketh tobacco, cannot leave it; it doth bewitch him"? And who can deny the justice of his final pronouncement: "It is a custom loathsome to the eyes, hateful to the nose, harmful to the brain, dangerous to the lungs, and, in the black, stinking fumes thereof, nearest resembling the horrible Stygian smoke of the pit that is bottomless."

Popularity of Tobacco Accounted For.

Yet, with all this opposition, smoking advanced in public favour till to-day it has practically the whole civilised world at its feet. How may this almost unrivalled popularity be accounted for? One thing helps to make it clear. Tobacco, like opium, is a powerful narcotic, having a specific influence upon the nerve centres. It is an extremely deceptive drug, which taken into the body creates a sort of artificial felicity, a feeling of ease and well-being that has no foundation in fact. It often seems to allay nervousness when in reality it slowly and insidiously breaks down the nervous system, and leaves its victim in the end a nervous wreck. Sometimes it appears to exert a stimulating influence upon the brain cells, but there always follows a period of depression, calling for a repetition of the dose, and the tendency is inevitably to increase the quantity. The peculiar fascination of tobacco, making a discontinuance of its use extremely difficult, is in itself a powerful argument against it.

Effect of Tobacco on the Young.

Tobacco is universally conceded to be disastrous to the young, dwarfing their half-developed organs, enfeebling the mind, destroying the memory, weakening the heart and lungs, and in various other ways hindering their normal development. Parents are surely not awake to the fearful ravages of the cigarette habit among our boys or they would put forth greater efforts to warn them against the vice. Dr. A. Clinton, of San Francisco, physician to several boys' schools, writes:—

"A good deal has been said about the evils of cigarette-smoking, but not one-half the truth has ever been told. Cigarette-smoking first blunts the whole moral nature.

It has an appalling effect upon the physical system as well. It first stimulates and then stupefies the nerves. It sends boys into consumption. It gives them enlargment of the heart, and it sends them to the insane asylum. I am often called in to prescribe for boys for palpitation of the heart. In nine cases out of ten this is caused by the cigarette habit. I have seen bright boys turned into dunces, and straightforward, honest boys made into miserable cowards by cigarette-smoking."

But tobacco has an injurious effect also upon adults, as is strongly maintained by medical men who have given the matter special attention. Referring to the unanimous verdict against juvenile smoking, Dr. N. S. Davis, Professor of the Practice of Medicine at Northwestern University, Chicago, very pertinently asks:—

What Need of Tobacco?

"What possible physiologic or psychologic need exists in the man of mature growth that did not exist in him before such maturity? Are not the processes of assimilation and nutrition, by which all the structures of the body are kept in repair to the end of life, identically the same in childhood and youth as in old age, and governed by the same physiological laws? And if the use of anæsthetics and narcotics, like alcohol and tobacco, is capable of so far impairing those processes during growth as to render such growth incomplete, will it not as certainly impair these same processes in both middle and old age, and thereby make the nutrition necessary for tissue repair less perfect, and thereby encourage tissue degeneration and early failure of life? And is not this last question answered affirmatively by the vital statistics of every country, as well as corroborated by the results of life

insurance, and by daily observation in all classes of human society?"

Soothing Effects of Smoking.

Of tobacco as a soothing agent, Dr. Davis writes: "The mental longing caused by overwork is simply for rest, fresh air, and wholesome food. Furnish these, and the longing is removed, and the man ready for work. But alcohol and tobacco, instead of furnishing what the longing demands, simply diminish the sensibility of the nerve cells of the brain, the material seat of man's consciousness, and thereby render him temporarily incapable of knowing how weary he is. When this temporary effect has passed, instead of being fresh and ready for work, he is more tired, and mentally duller than before, and more ready to ask for another drink or smoke. The same is true of all the so-called psychic or mental longings or cravings. They are in no proper sense natural or physiological conditions, but unnatural or artificial ones, created by causes, the removal of which constitutes the only legitimate or effectual remedy."

Disturbances in the Blood.

Sir Benjamin Ward Richardson, F.R.S., found that tobacco caused disturbances in the blood, and "rapid changes in the red globules." To quote his exact words: "They [the globules] lose their round shape, they become oval and irregular at their edges; and instead of having a mutual attraction for each other, a good sign of physical health, they lie loosely scattered before the eye and indicate to the learned observer as clearly as though they spoke to him, that the man from whom they were taken is *physically depressed* and *deplorably deficient both in muscular and mental power*." (Italics ours.)

A Doubtful Pleasure.

The same physician further delivered himself thus: "Smoking tobacco, and the use of tobacco in every form, is a habit better not acquired, and when acquired is better abandoned. The young should specially avoid the habit. It gives a *doubtful* pleasure with a *certain* penalty."

Sir Benjamin Brodie, who was physician to Queen Victoria, has left on record this careful statement of his views on smoking: "The effects of this habit are, indeed, various, the difference depending on difference of constitution and difference in the mode of life otherwise. But, from the best observations which I have been able to make on the subject, I am led to believe that *there are very few who do not suffer from it to a greater or less extent.*" (Italics ours.)

Action of Tobacco on the Heart

On another occasion he said of the same habit: "It powerfully affects the action of the heart and arteries, producing invariably a weak, tremulous pulse, with all the apparent symptoms of approaching death."

"One of the commonest results of excessive smoking," writes Sir Lauder Brunton, M.D., consulting physician to St. Bartholomew's Hospital, "is chronic pharyngitis, with irritability of the throat, cough, and hoarseness, and sometimes the irritation also affects the tongue. Weakness of vision, nervous tremor, and giddiness are frequently the result of tobacco-smoking. It is difficult to decide how far these are due to the direct action of the tobacco-smoke upon the nervous system and how far they are caused through alteration in the circulation. The circulation becomes much affected, palpitation and pain in the cardiac region are common results. Sometimes,

though rarely, the cardiac pain may be so great as to simulate *angina pectoris*."

A Possible Cause of Dyspepsia.

Dr. J. H. Kellogg, Superintendent of the Battle Creek Sanitarium, has found smoking the main cause in many obstinate cases of dyspepsia, which utterly refused to yield to treatment till the habit was discarded.

The eyes are among the first organs to suffer from tobacco. Confirmed smokers very rarely have good eyesight, and investigations have shown that employees in the large tobacco factories almost universally suffer with their eyes. Dr. Drysdale mentions seeing in one week at the Royal London Ophthalmic Hospital two cases of total blindness caused by tobacco, the sufferers being men under thirty.

Tobacco heart is a well-known affection, and was the cause of rejecting thousands of would-be recruits in the Spanish-American and South African wars.

Degeneration of Tissue.

The stomach, liver, kidneys, lungs and throat all suffer more or less severely from tobacco; but perhaps its most pernicious action is in causing a degenerate condition of the cells of the whole body, thus paving the way for such diseases as cancer, Bright's disease of the kidneys, and other affections of the tissues.

It is generally recognised that the confirmed smoker has poor chances of recovery from any disease that he may have contracted. His system is clogged with tobacco poisons, he is saturated with nicotine, and he does not respond properly to the treatment. Surgeons dread to operate on such a man. They know that his heart is

weak, his vital resistance low, and that the wound will heal but slowly if at all.

Does Smoking Aid in Mental Work?

It is sometimes pleaded that smoking is an aid to mental work; but the facts do not warrant such an assumption. Nearly half a century ago the French Emperor, Napoleon III, learning that tobacco-using pupils of the Polytechnic School at Paris, failed in their examinations, promptly forbade the practice. About the same time the Minister of Public Instruction issued an ordinance forbidding smoking in other public schools of this character throughout France, on the same grounds. More recent tests in universities and public schools in America have always shown non-smokers to possess the higher averages of scholarship. The facts, then, go to prove that not only does tobacco not assist, but it actually hinders the best mental work.

Smoking Avoided by Athletes.

Of course it is generally admitted that tobacco is not good for athletes in training. No man smokes who wishes to be in the best form. Confirmed smokers are not likely to be found among long-distance swimmers, cyclists, walkers, or rowers, who have distinguished themselves.

Some years ago Dr. Jay W. Seaver, Professor of Physical Culture in Yale University, found by a series of careful tests that non-smoking students made far better records in physical development than smokers, increasing in height 24 per cent. more than the others, while in chest capacity their superiority was more than 77 per cent.

Men Who Have Not Smoked.

While smoking has, by reason of its insidious fascination, achieved wide popularity, it is well to remember that a

very large number of the best men have never yielded to the enslaving habit. The greatest names in literature cannot be associated with the "fragrant weed." Homer, Virgil, Dante, Chaucer, and Shakespeare recorded their beautiful thoughts in beautiful language, with minds unclouded by narcotics.

Sir Isaac Newton, when urged to smoke, nobly replied that he would make no necessities for himself. Gladstone and Salisbury were non-smokers, and this is probably one of the reasons why both attained to a good old age, and possessed keen, active minds, and considerable vigour of body almost to the last.

Among living men of prominence Lord Roberts, the Rt. Hon. Arthur Balfour, Sir Michael Hicks-Beach, and the Marquis of Lansdowne are good examples of non-smokers; so also is Theodore Roosevelt, the apostle of the strenuous life. Roosevelt's most illustrious predecessors in the Presidential chair, namely, Washington, Jefferson, and Lincoln, were also non-smokers. Benjamin Franklin was another American who never smoked.

Some Illustrious Victims.

General Grant was an inveterate lover of the weed, and died of smoker's cancer. Emperor Frederick of Germany, father of the present Kaiser, is believed to have contracted through excessive smoking the throat affection which cut him off in his prime.

Carlyle was a slave of tobacco, but chafed under its bondage, and declared the habit irredeemably bad. Ruskin considered tobacco "the worst national curse of modern civilisation." He thought on of its demoralising effects was in enabling youths to pass their time happily in idleness.

Smoking Always a Drawback.

Many more names might be cited, but they are not needed. It would be idle to deny that men leading lives of great usefulness have smoked; but in the light of the facts it would be equally idle to attempt to deny that these same men might have enjoyed better general health, have lived longer, and accomplished even more in certain directions than they did had they been free from the depressing effects of this unfortunate habit. In other words, they were great not in any sense *because* of tobacco, but *in spite* of it.

To Give Up Smoking.

There is yet one more matter to consider; namely, how to give up smoking. Many have tried, and have failed through not trying the right way. To the victims of this habit we would say, first of all, don't give it up by degrees; that is only to prolong your misery. Cut the habit clean off, just as you would any other habit that was doing you harm. Perverted nature will for a few days call loudly and incessantly for its usual indulgence, just as a spoilt child screams, and kicks, and makes a great ado to attract attention, and get what he wants; but the child quiets down in time, when no notice is taken of him, and so will the appetite for tobacco. It is only a make-believe appetite after all. Your system really does not need tobacco-smoke and has been doing its best all these years to get rid of it as soon as introduced; but with its limited facilities, it has not been able fully to cope with the evil. Consequently the body and all its organs are more or less charged with the nicotine, and the appetite for tobacco will not entirely disappear until the system is cleansed. For this purpose hot packs, wet-sheet packs, hot full baths, vapour baths, and vigorous outdoor exercise are all useful.

Attention to the Diet.

Attention should also be given to the diet while making the change. Eat plenty of wholesome fruits, with good, well-toasted bread and thoroughly cooked cereals. Take easily digested, nourishing food, allowing plenty of time to masticate thoroughly.

Don't leave off work; keep your mind well occupied with your usual duties, even if you do not do them quite as well as you would like for a few days. Idleness is sure to make the struggle harder. Having once taken the step, determine not to yield, and the struggle will very soon be over.

Cure Always Possible.

Don't think for a moment that you cannot give up tobacco. You can. The writer has seen men of nearly sixty who had used tobacco since they were ten years old break themselves of the habit absolutely, and in so doing reap a great benefit. Steadiness of nerve, a hearty appetite for simple food, a delight in what is good and beautiful, enjoyment of the fresh air and sunshine — all these and many other delights come fresh to the one who emerges victorious from the clouds of the filthy narcotic, and takes his stand on the side of purity and truth.

The Reward.

There is a joy, moreover, in the very conflict; for the determination to cut loose from everything unworthy and in the least degree impure, and to dedicate all one's powers to the noblest uses, brings with it a deep soul satisfaction and an abiding peace known only to those who have tried it. Goethe's well-known saying: "*Das leben beginnt mit entsagen*" (Life begins with renunciation) is indeed true, and self-denial, even in one's little personal habits, brings with it its own great reward.

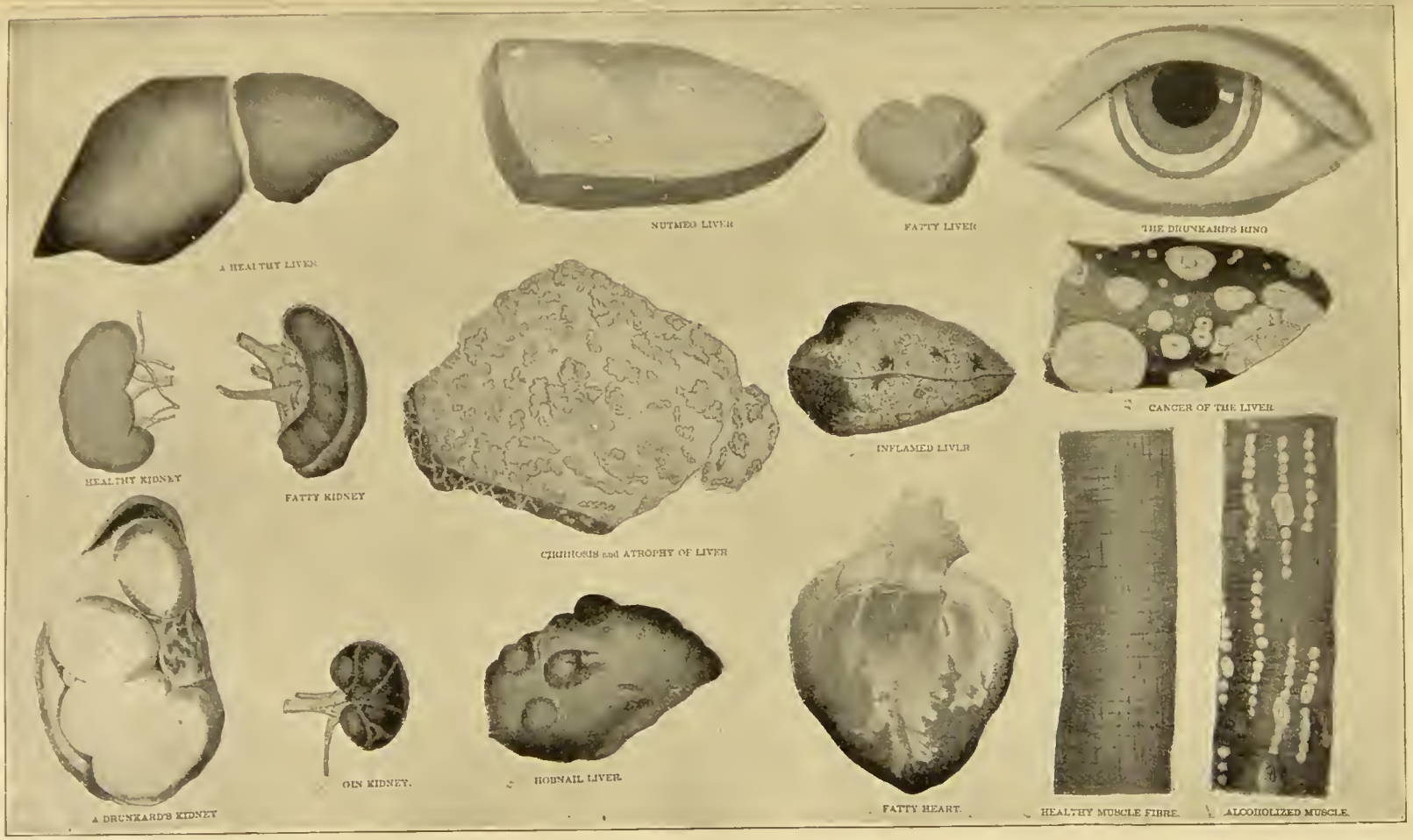
CHAPTER XXI.

Alcoholic Stimulants.

PERHAPS no one subject has had so much attention given it in the last twenty-five or thirty years as the use of alcohol in health and disease. Seldom have scientific investigators given so unanimous a verdict. With every fresh ray of light thrown upon the subject, the case for alcohol has become worse, till to-day it is almost universally regarded by our foremost medical men, not as a useful stimulant, but as an insidious poison which undermines the systems of those who use it even in great moderation, while its free use is accounted simply suicidal.

The Attitude of Medical Men.

Certainly the petition signed by nearly fifteen thousand British physicians, asking for the teaching of hygiene and temperance to be made compulsory in the public schools, is not without its deep significance. The British Medical Temperance Association, which led out in this excellent movement, is itself a sign of the times, and the monthly magazine it issues, as well as the numerous scientific papers, tracts, and booklets prepared by its members prove conclusively that a considerable section of the medical men are fully awake to the alcohol evil, and are taking vigorous steps to make it known to their colleagues, and to the general public.



EFFECTS OF ALCOHOL UPON THE VITAL ORGANS.

The Nature of Alcohol.

Let us consider briefly what has been found out in regard to this very common drug. "Pure alcohol," wrote Sir Benjamin Ward Richardson, "is a transparent fluid; it is of rather pungent odour; it is hot or burning to the tongue, and it burns in the air. It is much lighter in weight than water. A bottle filled with water weighing 1,000 grains, will be equally filled with alcohol weighing only 792 grains, or 208 grains less than the weight of water."

Not Really a Stimulant.

Alcohol is commonly spoken of as a stimulant: but it is more correctly described as a narcotic. The flushing of the face which is perhaps the first noticeable effect of alcoholic indulgence, is due to paralysis of the nerves controlling the minute blood-vessels. The action extends not only to the face, but to all parts of the body. As a result of this disturbance of the capillary circulation, the heart begins to beat faster, the increase varying (from one-eighth to one-fourth) according to the amount of the alcohol taken. This stage of "primary excitement," as it is called, continues for some time, after which the heart begins to flag from over-exertion, and more alcohol is required to keep up the pace. Meanwhile the stomach, liver, spleen, the kidneys and other organs are gorged with blood, the normal circulation being quite completely upset.

Different Stages of Alcoholic Poisoning.

In the second stage of alcoholic poisoning, Dr. Richardson tells us, the spinal cord is affected, and nervous control of the muscles is more or less lost, the muscles of the lower limbs being among the first to give way. Good mechanical work is impossible in this stage, and in the

young vomiting and faintness are not unusual. In the third stage, the brain centres are brought under the control of the poison, and "the rational part of the nature of the man gives way before the emotional, passional, or organic part. The reason is now off duty, and all the mere animal instincts and sentiments are laid atrociously bare." "Finally," writes Dr. Richardson, describing the fourth stage, "the action of alcohol still extending, the superior brain centres are overpowered; the senses are beclouded, the voluntary muscular prostration is perfected, sensibility is lost, and the body lies a mere log, dead by all but one-fourth, on which alone its life hangs. The heart still remains true to its duty, and while it just lives it feeds the breathing power. And so the circulation and the respiration, in the otherwise inert mass, keep the mass within the bare domain of life until the poison begins to pass away and the nervous centres to revive again."

Deceptiveness of Alcohol.

Such, in general, are the physical effects produced by alcohol. We see that little by little the deadly drug steals away the activities both of mind and body, and finally leaves the man unconscious. It is very deceptive in all this, for especially in the early stages the victim feels that he is in an exceptionally fit state. Sir Lauder Brunton has remarked of the mental processes that "though alcohol renders them much slower, the individual under its influence believes them to be quicker than usual."

That such a powerful poison cannot be used habitually without doing harm to the various structures of the body follows without saying. All experiments accordingly go to prove that alcohol is a protoplasmic poison, and as

such works serious injury upon both animal and plant life. Thus Dr. Ridge found that a one per cent. solution of alcohol killed cress seeds, while one part in ten thousand (one drop in a pint of water) retarded their growth. Even the yeast plant itself, which produces alcohol, is killed by its own product after the strength is developed beyond 13 per cent.

How the Blood Is Affected.

Blood is poisoned by alcohol and not fortified, the white and red blood-cells having their activities seriously impaired. Muscular power is diminished, while heart, lungs, stomach, kidneys, and liver, all are subjected to an abnormal strain under which more or less rapid degeneration sets in. That alcohol is a cumulative poison is proved by the late report of the United Kingdom Temperance and General Provident Institution, founded in 1840, and having as policy holders both abstainers and non-abstainers. The figures extending over all these years show a mortality amongst moderate drinkers averaging 36 per cent. higher than that of total abstainers.

Stout and Nursing Mothers.

Physicians, we are sorry to say, have been known to recommend the use of stout to nursing mothers. As a matter of fact, the use of alcohol on the part of one or both of the parents is among the causes that have produced so many women who unfortunately *cannot* nurse their children if they would. Prof. Bunge, who has given this matter very careful investigation, has found that in the main the incapability of nursing is hereditary; that where the mother was not able to nurse her children, her daughter was likewise incapable. In those instances where the mother was able to nurse, while the daughter was not,

he found that in 78 per cent. the father was a habitual drinker. He thus sums up his conclusions:

Hereditary Effects.

"The daughter of a drinker is rarely, if ever, able to nurse her children. As a rule, where the father has been a drinker, the daughter loses the power to suckle her children, and the capability is irrecoverably lost to all future generations. The incapability of nursing is no isolated phenomenon. It is accompanied by other symptoms of degeneration, in particular by a want of power to resist the inroads of disease of all kinds: nervous disorders, tuberculosis, decay of teeth. The children are insufficiently nourished, and so from generation to generation, the work of deterioration goes on, leading at length, after endless suffering, to the ultimate decay of the race."

Does Alcohol Aid Digestion?

It is sometimes maintained that alcohol aids digestion. Dr. Richardson has this to say on the question:—

"The common idea that alcohol acts as an aid to digestion is without foundation. Experiments on the artificial digestion of food, in which the natural process is very closely imitated, show that the presence of alcohol in the solvents employed interferes with and weakens the efficacy of the solvents. It is also one of the most definite of facts that persons who indulge even in what is called the moderate use of alcohol suffer from dyspepsia from this cause alone. In fact, it leads to the symptoms which, under the varied names of biliousness, nervousness, lassitude, and indigestion, are so well and extensively known."

Going on to describe more in detail the action of alcohol in the stomach, the same physician says:—

"It excites over-secretion of the stomach, and acidity, and in the end it leads to weakened contractile power of the vessels of the stomach, to consequent deficiency of control of those vessels over the current of blood, to organic impairment of function, and to confirmed indigestion."

Alcohol and Brain Work.

We have already mentioned the deleterious action of alcohol on the mental powers. Professor Huxley, who was not a total abstainer, and might therefore be supposed to be friendly to the use of the narcotic, was asked once if he found alcohol a brain stimulant. His reply was: "When I have to do good or original brain work, I always decline to have it; I become a total abstainer for the time being."

Concerning the effect of alcohol on muscular activity, Dr. Richardson writes:—

Alcohol Reduces Muscular Force.

"I have found by direct experiment that the effect of alcohol is to reduce the muscular force, and that even during the excitement which alcohol produces in the stage of excitement, there is no actual increase of power, although there may be great muscular disturbance and apparent excess of motion. The general evidence on this point is most conclusive, and if I might venture to state my own individual experience, I would say that the evidence is as surprising as it is satisfactory. I have worked actively while indulging in a moderate measure of alcohol daily. I have worked actively while abstaining altogether. In a word, I have made direct personal experiment on the subject, and I am bound to state that the work that can be done during entire abstinence is superior in every

respect—in respect to amount, in respect to readiness of effort, in respect to quality, in respect to endurance, and in respect to mental ease and happiness."

Dr. Nansen on Alcohol.

The old erroneous idea that alcohol somehow imparts warmth to the system dies hard. Dr. Nansen, while at a dinner of medical men and scientists held at Munich, was asked, "Did you take any alcohol with you when you left the 'Fram' to make your heroic expedition by sledges?" "No," replied Nansen, "if I had done so, I should never have returned." The real effect of alcohol, as already suggested, is to dilate the capillaries, thus bringing the blood to the surface of the body, where it is the more quickly cooled, resulting in a lowered bodily temperature, which may be followed by death from the cold.

Of alcohol as the cause of disease, Sir Andrew Clark, M.D., physician in ordinary to the late Queen, wrote:—

A Potent Cause of Disease.

"As I looked at the hospital wards to-day, and saw that seven out of ten owed their diseases to alcohol, I could but lament that the teaching about this question was not more direct, more decisive, more home-thrusting than ever it had been. . . . Can I say to you any words stronger than these of the terrible effects of the abuse of alcohol? It is when I myself think of all this that I am disposed, as I have said elsewhere, to rush to the opposite extreme, to give up my profession, to give up everything, and to go forth upon a holy crusade, preaching to all men —*Beware of this enemy of the race.*"

Mr. A. A. Hill, L.R.C.P., etc., speaking of the medical phase of Total Abstinence in a recent address, made the following statement:—

Alcohol Undermines the Constitution.

"Alcohol is neither food, tonic, nor stimulant. It is first an irritant, then a depressant. Taken habitually, even in small quantities, it will gradually undermine and finally destroy the constitution. This slow sapping of the vital forces is going on continuously. It weakens the nervous system and prepares the soil, especially among women, for many nervous diseases, such as hysteria, chorea, epilepsy, and insanity.

"It likewise lays a promising foundation for tubercular disease, diabetes, cancer, Bright's disease and other fatal maladies dependent upon impaired and defective nerve nutrition. The man or woman who drinks moderately sees no danger; but the constitution is being surely, if slowly, undermined, and on the attack of some serious illness, succumbs to the onslaught, when a total abstainer would have rallied and recovered."

The Beginnings of Alcoholism.

In the foregoing paragraphs we have dealt with the physiological effects of alcohol. There still remains the question, What are the initial stages in the acquirement of the appetite for this narcotic? For a radical answer we must look in the direction of diet. Usually a man goes astray from the path of physical rectitude in eating before he does so in drinking. The dinner table, possibly that set by the most ardent of temperance reformers, may have as its logical outcome the public-house. In general, all highly spiced "made dishes" tend to produce an abnormal thirst which requires something stronger than water to satisfy. Irritating condiments, such as pepper, mustard, vinegar, Worcestershire sauce, and the like have previously been mentioned as injurious to the digestive organs; they

are also obnoxious as creators of the alcoholic thirst. The free use of flesh meats is probably a still more common cause of the craving for alcohol. The extractive poisons contained in the flesh of animals are in the nature of stimulants, and their introduction into the system produces effects which are analogous to those of drug stimulants. There is at first a feeling of strength and well-being followed by a reaction. No doubt the free use of condiments of various kinds in connection with most meat dishes, intensifies this stimulating effect, which, however, is inherent in all flesh foods entirely apart from their accompaniments.

Alcohol and Flesh Foods.

Viewing the subject broadly, it is a well-known fact that the nations which consume large quantities of flesh foods, are also noted for an excessive consumption of alcoholic liquors. It is furthermore true that the craving for alcohol is overcome only with the greatest difficulty while a flesh diet is adhered to, but loses its hold with most victims when a diet of well-chewed cereals, fruits, nuts, and vegetables is adopted.

Gross eating in general, especially the taking of excessive amounts of proteid foods of any kind, tends in the direction of drink stimulants. It brings on a feverish state of the system in which thirst is excessive, and is of a different kind to that which is natural. Moreover, the appetite is pampered, the digestive system weakened, and the whole body is in a run-down condition in which it seems to require bracing up by means of a stimulant.

Moral Effects of Alcohol.

Of the moral effects of alcohol much might be said; but the limits of this chapter allow only a very few words.

Dr. Parkes, the eminent sanitarian, alleged that "if alcohol were unknown, it might be truly said that half the sin and a large part of the poverty and unhappiness of the world would disappear."

As a picture from real life, showing the awful demoralisation that everywhere attends the drink traffic, the following paragraph taken from a London daily is sufficiently convincing:—

"A Saturday Night Down East."

"A public-house, used principally by dockers, was watched one Saturday night for an hour and a half. The watchers saw during that time 795 persons enter its doors. Of these 209 were men, 380 women, 83 youths and girls, and 123 very young children and babies in arms. Seven perambulators were taken in, some of which had in them two children. Outside there was scarcely an uneventful moment. Three women were turned out and five men. There were one very bad fight and six disturbances. Three girls about seventeen came out quite drunk. Twenty-four men, including a postman in livery, and nineteen women left the house helplessly drunk. Two of the women had babies in their arms. At 10.50 the house had to be closed, with the exception of one small door, on account of a frightful row. A policeman had to stay outside after that until closing time."

Sad Transformations.

Drink makes insensate brutes of kind, loving husbands; it turns the best wives and mothers into slattern, slovenly, heartless creatures who let their children starve while they sell the very clothes from off their backs to satisfy the passion for alcohol. The demon of drink takes possession even of little children. A tiny toddler in one of

the London hospitals was given a halfpenny the other day, and began at once to ask someone please to get him a "hap'orth of gin."

To such a deadly evil, which takes from the poor workingman fully one-sixth of his hard-earned wages, and gives him naught in return but a weakened body, and a much-weakened will, seriously benumbed moral powers, and oftentimes a ruined home, the golden advice replies: "Touch not, taste not, handle not." Truly "wine is a mocker, strong drink is raging, and whosoever is deceived thereby is not wise."

How to Get Rid of the Drink Habit.

The way to get rid of the drink habit is to cut it squarely off, and adopt a simple diet consisting mainly of fruits, cereals and nuts. The free use of fruit is especially recommended as a means of getting the system into a healthy condition, in which the old appetite can be entirely thrown off.

Moral strength is required, and nothing brings it like prayer. The man who is caught in the toils of this terrible habit needs Divine help to make good his escape; he needs the strength that comes from complete submission to the Divine will, and the fruitful determination henceforth to glorify God in mind and in body.

CHAPTER XXII.

Common Diseases and their Hygienic Treatment.

IT is estimated that there are about fifteen hundred diseases to which man is subject. Most of these, fortunately, are rare, and need not even be mentioned here. Some, however, are very common, being frequently met with in daily life. A few of these latter we will briefly describe, and also give some hints as to their home treatment.

The term "disease" is derived from the French, and means "uneasiness" or "lack of ease." This is certainly an apt description. In general, disease is an abnormal condition of body or mind, or both may be affected at the same time. Diseases are either organic or functional. If there is structural change, the disease is *organic;* if no structural change can be discovered in the tissues, it is said to be *functional.*

Symptoms and Signs of Disease.

Disease, whether organic or functional, means a change or perversion of function. The normal becomes abnormal. The physiological function becomes a pathological one. The changes are always accompanied by more or less visible evidence, subjective and objective, which we may call signs and symptoms. An ache or a pain is a symptom. A yellow skin, as seen in jaundice, is a sign. A

rapid pulse and difficult breathing are also signs, and each sign or symptom has its special significance.

Some signs and symptoms are common to many forms of disease, and consequently are only of general interest. Others, however, are peculiar to certain diseases or classes of diseases and are thus of vast importance. The latter are known as diagnostic signs or symptoms. A good example is the characteristic "bark" of whooping cough, and another, the rusty sputum of pneumonia.

Course and Termination.

Many diseases have a more or less regular course, and last a certain number of days or weeks. Under favourable circumstances, the patient then begins to mend, and convalescence is uneventful. But there are numerous conditions and circumstances which are likely to modify the usual course, such as weakness and debility of the patient, the complication of another disease, or an unusually severe attack. Consequently it is difficult to anticipate the outcome with much certainty. In general, careful nursing is the largest factor in securing a good recovery, especially after convalescence has set in.

RESPIRATORY DISEASES.

We shall first consider diseases affecting the organs of respiration, such as the nose, throat, bronchial tubes, and lungs. These diseases are among the most common and fatal, and they account for a large percentage of the annual death-roll.

For instructions concerning the various natural remedies prescribed in the following pages, the reader will kindly turn to the chapter on Hydropathic Treatments.

A Common Cold.

This is essentially an acute catarrh of the nose and upper throat. It is believed to be the work of germs, for it spreads easily, and the patient is liable to infect others. A "cold in the head," as it is often called, begins with a chilly feeling and sneezing. There is some fever, and often headache, and the bowels are constipated. Then the nose begins to discharge, the mouth and throat feel sore, and the eyes are usually congested. Sometimes the stomach is also affected, the symptoms being loss of appetite and various digestive disturbances.

Take the case in hand without delay. First give a soap enema to cleanse the bowels, and then administer a hot mustard foot or leg bath, and, at the same time, give two or three glasses of hot water to drink. After free perspiration, give a wet-hand rub or a cold mitten friction; then dry the patient and send him supperless to bed, with a hot bottle to his feet.

For several days the diet should be light, consisting largely of fruit, either fresh or stewed, and well-baked bread. The foot bath may be repeated, if necessary, or a warm full bath or a vapour bath may be administered instead.

An Acute Sore Throat.

This usually accompanies a cold in the head. The mucous membrane of the mouth and throat becomes inflamed, raw, and very sensitive. Sipping hot water or lemonade will relieve the soreness. But a hot fomentation wrapped round the neck is about the best treatment. It should be applied snugly for five minutes, and then replaced by a fresh one wrung out of hot water. After three or four such applications, bathe the neck with cold water

and dry gently. Now apply a cold compress, to be retained overnight. See page 351.

Clergyman's Sore Throat.

Chronic sore throat is very obstinate to deal with. The proper treatment is a course of hot fomentations to be taken daily before going to bed, and then the cold compress overnight. When the compress is removed in the morning, the neck should be well bathed with cold water and dried. The inhalation of menthol, eucalyptus, and other oils and balsams in the form of a fine spray or vapour is often helpful. For this purpose a suitable instrument, called a nebuliser or vapouriser, is required. To be effectual, such instruments must be used faithfully for ten minutes three or four times each day, and often for a long time.

Gargles, too, are helpful at times. An excellent gargle and mouth wash is prepared by adding half a teaspoonful of salt to a glass of warm water. Peroxide of Hydrogen, Hydrozone, or Listerine, diluted with one to three parts of water, are efficient gargles, and can be obtained from any chemist's shop. To secure favourable results, the treatment must be persisted in for weeks, and even months in some cases.

Laryngitis or Inflammation of the Voice-Box.

This affection is usually, though not always, associated with a cold or sore throat. The voice becomes hoarse, and may even be temporarily lost. There is also a cough, and swallowing becomes painful. The delicate vocal cords are red, swollen, and inflamed, and fail to vibrate properly, this causing the loss of voice.

Prompt treatment is necessary, for the swelling may

lead to closing of the narrow slit-like opening into the wind-pipe, and thus interfere with breathing. Give the patient hot, moist air to breathe. This can easily be done by attaching a paper tube, made from a newspaper or common wrapping paper, to the spout of a tea-kettle, and inhaling the warm vapour, taking care not to burn the throat. Another way is to apply hot, moist cloths (fomentations) to the neck. A third method would be to let the patient sip hot water. Sometimes a hot foot bath gives relief. Croupous Laryngitis, or True Croup, is a very fatal disease which is usually confined to early childhood. Fortunately it is extremely rare. A physician should be called at once to treat the child.

Don't Neglect a Cold.

Too often a cold is neglected because it is regarded as too insignificant to require attention. But this is a mistake which may lead to grave consequences. Not infrequently a consumptive traces his dread malady to a neglected cold in the head from which he never recovered. Again, such a cold, if ignored, may lead to bronchitis or inflammation of the lungs. A little effective treatment at the outset, with rest and a light diet, will soon relieve the patient, and prevent serious after effects.

Influenza.

Influenza is sometimes regarded as a hard cold with constitutional effects. Like colds, it is probably due to microbes. One person easily takes it from another, and so it is communicated to the other members of the family. There is severe prostration at the start, with considerable fever, and much pain, and distress. There is headache and backache, and the bones generally seem to ache.

There is also a severe cold in the head, with discharge from the nose. The symptoms sometimes begin with a severe chill and nausea.

Put the patient to bed at once. Restrict the food, if necessary. Give a hot soap enema to cleanse the bowels, which are usually costive. Then follow with a hot full bath or a vapour cabinet bath, with hot water to drink. Apply fomentations to the chest, if the bronchial tubes are involved. A fomentation to the spine will often give great relief. Finish with a cold sponge and an oil rub.

In severe cases a hot blanket pack will afford most relief. Chest packs, fomentations to the spine and abdomen, tepid sponges, cold mitten frictions, and massage are the general procedures to adopt.

Hay Fever or Asthma.

This annoying affection is most prevalent in the latter part of the summer and early autumn. It is an inflammation due to the irritation caused by hay dust, the pollen of flowers, and indeed any fine dust or powder. It is most annoying in the morning, when both nose and eyes run, and the throat is dry and irritable. There is often a cough as well. The nasal membrane is usually swollen and inflamed, making breathing difficult, and the eyes often suffer with an itching sensation. With the exception of these symptoms, the patient may be in fair health.

A change of climate and environment is the most successful treatment. Little can be done at home except to insure good hygiene and a light, wholesome diet. Feeble digestion and an inactive condition of the liver are often the predisposing causes of this malady. Hence its victims should look well after their food supply and eating habits. A long sea voyage is one of the best means of affording relief.

Pleurisy.

Pleurisy is an inflammation of the membrane which covers the lungs. The membrane is really a double one, enclosing a small space called the pleural cavity. This space contains a serous fluid which serves the purpose of a lubricant.

Pleurisy is usually confined to the right or left side of the chest, and begins with a sharp pain which is aggravated by breathing. There is fever and rapid, shallow breathing, and the patient has an anxious, distressed appearance. Breathing is noisy at first, due to the scraping of the dry membrane. Soon an exudation of fluid takes place, which may require tapping to be got rid of.

Heat, in the form of fomentations or chest packs, will give great relief. A hot leg bath or leg pack, followed by cold sponging and quiet rest in bed, will soon bring improvement. If the bowels are constipated, give a warm enema. The family physician should be sent for.

Bronchitis.

As the name indicates, this is an inflammation of the bronchial tubes or air passages of the lungs. A severe cold may extend to these tubes and produce bronchitis. The causes are similar to those which produce a cold in the head. The lining membrane of the bronchial passages becomes reddened and swollen. A mucous discharge takes place, which is occasionally tinged with blood. There is free expectoration, and a cough which persists for several days. Otherwise a slight fever, some weakness and temporary prostration, with but little pain, characterise bronchitis.

For treatment see Chronic Bronchitis.

Winter Cough or Chronic Bronchitis.

A persistent cough which returns from winter to winter is the characteristic symptom of chronic bronchitis. It may be due to exposure to the weather or to irritation caused by a cold, damp climate. It may also be the result of an acute attack which persists. Aged people are often subject to a winter cough. It is also present in certain forms of heart disease.

There is considerable slimy expectoration of a yellowish or whitish colour. The patient complains of soreness behind the breastbone. There is no fever, and otherwise the health may be good.

The treatment of both acute and chronic bronchitis consists mostly of hygienic measures, such as the adoption of a light and simple diet, suitable exercise, proper clothing, and bathing. Tonic treatment, in the way of neutral baths, salt glows, and cold mitten frictions, is useful. A course of fomentations to the chest will often produce good results, also the heating compress at night. In some cases a change of climate is desirable.

Pneumonia or Inflammation of the Lungs.

Pneumonia is the scourge of the aged. It is always to be regarded as a serious illness, and prompt measures should be taken to check its progress. Pneumonia begins with a severe chill, a high fever, and rusty expectoration. There is great prostration, a severe headache, and pain and soreness in the chest. The patient loses appetite entirely, and the bowels are, as a rule, constipated. The breathing is laboured and painful, and the heart beats rapidly. There is also a dry cough.

Begin the treatment with a warm enema, and a hot full bath. Foment the chest with hot cloths, and keep

the patient warm in bed. He must have absolute rest. Give him hot water to drink freely. The room should be well ventilated, and the patient protected from extremes of heat and cold. Raise the head well. A semi-reclining position is best to relieve the laboured breathing.

The diet should be semi-fluid, consisting of fruit juices, gluten gruel, custards, junkets, plain egg-nog, and well-baked breads. Water and lemonade may be taken freely.

It is always necessary to call in a physician promptly on the appearance of pneumonia.

Consumption of the Lungs or Pulmonary Tuberculosis.

Consumption is the " great white plague " of all lands, civilised and heathen. Tuberculosis is accountable for about one-seventh or one-eight of all the deaths. In some countries the proportion is even greater. The tubercle bacillus is believed to be the active agent in the disease. This germ is almost omnipresent. It is found in the air and in the dust of the house and street—an unfortunate state of affairs due to the careless habit of expectoration, which is well-nigh universal. The consumptive patients thus spread their infection far and wide, and keep the disease alive.

Proper measures ought to be taken to prevent the spread of this terrible scourge. Consumptives should never expectorate except into a cup containing a disinfecting fluid, or into a handkerchief to be burned before it can dry. Japanese paper handkerchiefs serve this purpose very well, and they are also cheap.

Predisposing Causes.

Although heredity is considered an important factor in the ætiology of consumption, still it rarely happens that

the disease is directly transmitted from parent to offspring. Undoubtedly a weakened constitution and even a distinct susceptibility to the disease may be inherited. This, with the pollution of the home through lack of sanitation, and the intimate association of the children with the consumptive parent, easily accounts for the numerous cases where the disease attacks the children as well as the parents. With proper hygiene and favourable conditions in the home, such cases would very soon become practically unknown.

No age is immune from consumption, but the most susceptible age is from eighteen to thirty. People seem most likely to succumb in early adult life.

The Influence of Occupation.

There are trades and occupations which definitely favour the development of pulmonary consumption. Among these is mining, and especially coal-mining. The fine dust particles become very irritating to the delicate tissues when breathed into the lungs, and the irritation may give rise to a slight inflammation, which renders the organ more vulnerable to the infection.

Stone-breakers and all workers in stone, as well as those exposed to metal filings, are also peculiarly susceptible to attack.

Any trade involving close, stuffy rooms and the breathing of foul air favours consumption. All those obliged to lead a sedentary life should make it a rule to get out-of-doors in the fresh air as much as possible, and to cultivate deep breathing.

A severe illness sometimes weakens the resistive forces of the body, and so renders the patient more liable to infection.

Exciting Causes.

The bacillus of tuberculosis is believed to be the exciting cause of consumption. The mode of infection varies. Direct infection from the patient is undoubtedly rare. Inhalation, through breathing the dried germs from the sputum of consumptives, is a more frequent means of infection.

Some consider infection through the food and drink still more common. Tuberculous flesh is obviously dangerous, especially if not well cooked; but milk from tuberculous or otherwise unhealthy cows is likewise a source of danger, and should be strictly avoided.

Onset of the Disease.

One of the characteristics of consumption is its insidious onset. The patient takes a cold or has an attack of influenza and, before he realises it, he has developed tuberculosis. Or he may have merely a cough, to which he pays little or no attention; slowly he loses both strength and flesh, and again, before he is aware of anything serious, the doctor tells him his lungs are affected. Such is the history in many cases.

Signs and Symptoms.

With the loss of flesh and vigour, there is an increasing pallor of the skin, and a characteristic hectic flush of the face, with some fever. Digestion is more or less upset, a dry cough develops, the pulse becomes more rapid, and there is increasing expectoration.

In itself, pulmonary consumption is not a painful disease; but various complications, such as pleurisy, may cause much suffering.

With the increasing weakness comes sweating at night, which is often very profuse. The emaciation is finally very marked, and the patient becomes a mere bag of bones, with a skin that is almost transparent.

Hæmorrhage may occur in almost any stage, and is always a serious sign.

In the later stages the feet swell, which adds much to the discomfort of the patient.

The mind is not affected, but remains clear to the end. The patient is, as a rule, hopeful, and confidently expects recovery, even in the later stages.

Summed up in a few words, the leading symptoms are slight fever, sweating, cough, weakness, and loss of flesh.

The Cure of Consumption.

Until recent years, consumption was looked upon as an incurable disease. In the late stages it may be incurable, but if taken in hand early, a cure is not only possible, but probable. There is no drug or medicine that can be regarded as a cure for consumption. The natural cure consists of a healthful environment, with fresh air, pure food, suitable exercise, and an all-day-and-night out-of-door life.

A change of climate is often desirable, and at times necessary in order to obtain the best results.

The Climate for Consumptives.

A comparatively dry climate, with a moderate elevation and a fairly equable temperature, is the best for weak lungs. Plenty of sunshine, without great heat, is desirable. The elevation depends upon the extent and progress of the disease. In the early stages a moderate elevation of from one thousand to three thousand feet or even higher is desirable. Extremely high elevations do more harm than good in most cases.

Certain parts of Colorado and Southern California in America have justly acquired a good reputation as resorts for tubercular patients. The table-lands of Mexico are also suitable. On the continent, Davos and St. Moritz enjoy an excellent reputation for curing consumptives. In the United Kingdom, Bournemouth and the Isle of Wight are popular resorts for such patients, owing doubtless to their mild and fairly equable climate. The Highlands of Scotland are also favourable in many cases.

The essential thing is to find a place in the country, or by the sea-shore, where one can comfortably live out-of-doors a good share of the year. If the patient can sleep out-of-doors, so much the better.

Diet for Consumptives.

At the outset permit us to say that we do not believe in the "cramming method." More people are killed than cured by such an unnatural system. Nevertheless, consumptives do require a liberal diet, and should be given as much food as they can digest and assimilate, but no more.

The food should be plain, nutritious, and wholesome. Fruit, both fresh and stewed, can be used freely to advantage. Dextrinised breads and cereals are very nutritious and, at the same time, easily digested. Nuts, too, may be taken, but should be well masticated. Nut foods are useful, and mealy potatoes, as well as other wholesome vegetables, may be used. Milk, cream, butter, and eggs are very valuable, and serve to give variety, as well as to supply needed fats and proteids. As a rule, three meals a day are amply sufficient. However, if the patient is very weak and bed-ridden, he may be fed oftener, and in smaller quantities. The condition of the individual patient will have to determine this question.

Tonic Treatment.

Consumptives are physically debilitated, and have little vitality. They need tonic, strengthening treatment. Tepid, cool, and cold sponge baths, and mitten frictions, with salt glows, wet towel and sheet rubs, oil rubs, massage, and manual Swedish movements, are the hygienic measures most successful in staying the disease and effecting a cure. Neutral baths, electric light baths, and galvanic and faradic electricity are also useful. Care should be taken not to overdo the matter by giving the patient more treatment than he can take to advantage. Too much treatment weakens the patient, and exhausts what little strength he has left.

Relieving the Symptoms.

To combat the growing weakness and loss of flesh, give a liberal diet of plain, easily-digested food.

Hot sponges, as well as vinegar or alcoholic sponges, often relieve the perspiration.

Cold sponges and cold towel rubs will lower the temperature.

The cough may be relieved by fomentations to the chest or the heating compress overnight. Hot chest packs, too, are useful means of mitigating the dry, hacking cough that is so common.

But most important of all are fresh air and the outdoor life. These are essential, and other things are secondary.

Exercise for Weak Lungs.

Proper exercise out-of-doors and physical culture are the best means of strengthening the lungs. The object is to improve the breathing capacity and so bring more oxygen into the blood.

Again, great care must be taken not to overtax the patient and thereby do him injury. He should do only as much as he can accomplish with comfort. As he gains in strength, he may increase the exercise from time to time.

Breathing exercises are especially important. They should be taken five or six times a day, or oftener. Breathe in deeply and then breathe out again. Do the same while raising the arms forward or sideways above the head, or backward. Fill the lungs full, hold the breath a few seconds, and then exhale slowly. Breathing exercises may be taken lying down, sitting, or standing, according to the strength of the patient. See the chapter devoted to Physical Culture.

Walking is an excellent recreation, also hill and mountain climbing, if strength permits. Such work must be done gradually. Riding and, for weaker patients, carriage-driving, can be recommended.

How to Treat Bleeding of the Lungs.

Bleeding of the lungs is one of the signs of consumption which may be met with at almost any stage of the disease. Put the patient to bed with absolute rest, and send for a physician. Apply heat to the extremities and cold over the chest. The semi-recumbent position is best. A cold compress to the chest, changed frequently, or an ice bag, will help to check the flow of blood.

The blood coming from the lungs has a bright scarlet colour and is frothy, hence it is very easily distinguished from vomited blood, which is darker, somewhat resembling the colour of coffee-grounds.

Absolute rest must continue till the bleeding has ceased and the soreness has passed away.

DISEASES OF THE HEART, BLOOD-VESSELS, AND BLOOD.

The diseases of these organs are few in number, but of great importance. The heart is one of the vital organs, and anything disturbing its action has far-reaching effects.

Functional Disease of the Heart.

In this condition, although the heart is weak and incapable of doing its work properly, still there is no visible change in the structure of the organ. Perhaps the most common symptom, and a very annoying one, is palpitation or fluttering. The rapid and heavy beating is very pronounced, and naturally alarming. The cause is usually some disorder of digestion, especially fermentation in the stomach, with flatulence. Rest in the recumbent position, and a wash-out of the stomach bring relief. A cold compress applied to the heart will steady its action.

What to Do for Fainting.

Fainting is due to lack of blood in the brain and an insufficient supply of oxygen. Hence the patient should be promptly placed in the recumbent position, and the clothing loosened to favour free breathing and circulation of the blood. Tight waist bands, stays, and collars should all be undone, and plenty of fresh air supplied. Dashing cold water upon the face with the hand and slapping the chest over the region of the heart are useful measures in restoring consciousness.

Fatty Degeneration of the Heart.

Under certain conditions the muscle composing the heart may undergo a degenerative process and change into fat. This change naturally means a proportionate

loss of strength on the part of the organ, and, as a result, the circulation of blood is interfered with, and the entire body suffers for want of oxygen.

Fatty degeneration of the heart muscle is due to sedentary habits of life, over-feeding, and other errors of diet. The continual free use of rich and greasy foods is an important factor. But alcoholic liquors and tobacco are doubtless the chief causes. The disease is rare in life abstainers.

A perfect cure is problematical, but it may be possible to check the progress of the degeneration by correcting wrong habits and discarding alcohol in all forms, including ale and beer. The diet should be simple, condiments, rich and complicated dishes, sweets and pastries being avoided.

Strengthen the heart by tonic treatments, such as tepid and cold sponges, cold mitten frictions, wet-towel and sheet rubs, cold sprays and douches, cold compresses, etc., and suitable exercise.

Organic Heart Disease.

In this case there is structural change in the organ. The most common forms of the disease are various derangements of the valves of an inflammatory character. The inflammation leads ultimately to a thickening and hardening of the thin, delicate membranes, whereby they lose their elasticity and are no longer competent to close the openings and so prevent the back-flow of blood. Consequently there is leakage, and the circulation is retarded.

By means of exercise and various treatments, it is possible to develop the heart, and increase its size sufficiently to compensate for the leakage. This is called compensatory growth or hypertrophy.

Organic heart disease is incurable; but relief can be

obtained, and life prolonged, by means of suitable measures which serve to strengthen the heart muscle.

Hardening of the Arteries.

In their natural state the arteries are comparatively soft, elastic, and tough. Alcohol causes them to harden and become brittle. This change is a very serious one, leading to grave diseases in different organs of the body. With the loss of elasticity, the blood-vessels become much weaker, and are unable to meet any great extra strain put upon them.

Rupture of a blood-vessel may take place in any part of the body. If it occurs in the brain, the flow of blood from the vessels causes pressure on the brain substance, which may produce paralysis.

Apoplexy.

Apoplexy is produced by hæmorrhage in this way. A clot of blood is formed, which interferes with the functions of the brain, and the muscles on one side, or part of one side, become paralysed. The condition is also known as a "stroke," and is always to be looked upon as serious, for it indicates at once the weak state of the vessels generally.

The size of the clot determines the extent of the paralysis. If small, only a few groups of muscles will be involved, perhaps those of the right arm or leg. If extensive, all the muscles of either side may become involved, so that the power of speech is also lost.

The size of the clot also determines the outcome of the stroke. If small, absorption takes place, and after a time the patient is as well as ever. Permanent disablement of one side, more or less complete, is the result of free bleeding, and the recovery is slow and uncertain.

Treatment of Apoplexy.

The treatment consists of useful tonic measures to improve the general health, with galvanic and faradic electricity to the muscles, also massage and manual Swedish movements. The object is to prevent any further attacks, if possible, and restore the use of the affected parts.

The patient must be cautioned strictly to avoid excitement of all kinds, and severe strain either physical or mental. He must never run to catch a train or tram, or indulge in violent exertion.

Diseases of the Blood.

The numerous blood and iron tonics on the market show the great prevalence of anæmia and other blood derangements. The condition of the blood is really an index to the state of a person's health. "The blood is the life," in that it carries the means of sustenance to all organs of the body and removes the waste. Should the blood cease to circulate in a finger or limb, death of the part would soon take place. To be in a healthy state, each living cell must receive a supply of blood constantly.

Anæmia or Bloodlessness.

The patient is pale and weak, and shows a marked loss of energy, both physical and mental. There may be headaches and various other aches and pains. Otherwise, there is little to be noted in the way of symptoms. Of course the weakness is general; all the organs suffer from an impoverished blood supply, and the blood itself is thin and dark, due to want of oxygen.

Tonic treatment with good feeding are required. The patient should have rest and a change, if possible. A

trip to the country or the seaside with an outdoor life and plenty of wholesome food will soon work marvels. Neutral electric baths, salt glows, tepid and cold sprays, with massage, are the measures to be employed.

Don't take blood tonics or any of the advertised pills and draughts. Experience shows that cure-alls cure nothing, but, on the other hand, do actual harm.

DISEASES OF THE DIGESTIVE ORGANS.

These organs consist of the alimentary canal and its appendages. We will begin with the mouth, for there is where digestion starts.

White Patches in the Mouth.

These indicate lowered vitality and disorders of the stomach. They are often accompanied by a coated or furred tongue and a bad taste. Touch them with a piece of alum and gargle the mouth with salt water or peroxide of hydrogen diluted with water two or three times a day. Correct the diet and take fruit freely. Use such hygienic measures as will build up the body and improve the general health.

Acute Gastric Catarrh.

This is also known as colic. It is accompanied by considerable pain in the pit of the stomach, which at times is very sharp and severe. There is also sickness, and the vomit is acid and bitter, and may contain bile. Headache and constipation are often present.

Cleanse the bowels by a warm enema, and apply fomentations over the stomach and liver. If the stomach contains indigestible food, drink tepid water freely and induce

vomiting. This may be repeated in order to cleanse the organ.

The Dyspepsias.

Most people have, at one time or another, suffered from dyspepsia, The literal meaning of the term, which is of Latin origin, is "difficult digestion." The causes are numerous, but mostly dietetic, and therefore careful regulation of diet is required before a cure can be effected.

The symptoms vary considerably with the form of the disease. There is acid dyspepsia, which is accompanied by fermentation, flatulence, and a sour stomach.

Nervous Dyspepsia.

There is also a condition known as nervous dyspepsia, which is getting to be very common. The patient is cross and irritable, and has a capricious appetite, with little will power to govern it. The same food will agree with him one day and disagree the next. He is inclined to study the symptoms, and watch the digestive process of each morsel of food eaten. This introspection is very bad, and aggravates his condition. His mind must be diverted from his stomach and liver. A change of scene, or better still, the regimen of a sanitarium, is needful in many of these cases.

Atonic Dyspepsia.

This disease is frequently met with in feeble people. Digestion is almost at a standstill, and there is also a poor appetite to contend with. The patient is in an anæmic state and needs food. But he is not hungry and has to make himself eat, and, worst of all, his digestive organs are not in a fit state to take care of what he eats.

How to Treat Dyspepsia.

In most cases a special fruit diet for several days, with free water drinking and cleansing enemata, will afford relief. Fomentations over the abdomen, hot foot baths, and abdominal massage, are useful in relieving pain and hastening the cure.

Chronic cases are difficult to deal with, and especially so if the patient is not willing or able to control appetite and diet himself. To secure permanent improvement, he must expect to be abstemious, and be willing to give up all hurtful things, even though they taste good to a perverted appetite.

A Simple Diet.

This should consist of fresh and stewed fruit, nuts, dextrinised breads, well-cooked grains, and a few vegetables. Milk and eggs may also be used if they agree with the patient; but milk is very likely to ferment and cause flatulence. Eggs are a hearty food, and should be taken sparingly by those subject to bilious attacks.

It is scarcely possible to take mild fruits too freely. Apples, pears, grapes, bananas, etc., may be looked upon as natural medicines which assist in regulating the action of the body, and thus promote health.

"Fletcherising" the Food.

Mr. Horace Fletcher has done a world of good by calling attention to the importance of chewing the food well. By careful experiments he has shown that the full nourishment of food is only obtained by complete mastication. The chief reason for overeating is the rapidity with which food is hurried into the stomach by a great majority of people. Such a practice prevents them

from properly enjoying the delicious articles of food furnished us so freely and in such large variety by nature. Each mouthful should be so thoroughly chewed as to reduce it to a thin cream, which then passes down the gullet without the conscious act of swallowing.

Chewing is the first step of digestion, and is necessary in order to incorporate the saliva of the mouth with the food particles. The saliva or mouth juice possesses the power of digesting starch, but to accomplish this purpose it must be brought in contact with the food. This is effected by mastication.

The Number of Meals.

Three meals a day are amply sufficient for the great majority. Indeed, many people do best on two. The stomach is a muscular bag, and requires an interval of rest between meals. Such rest is also necessary to the glands which manufacture the gastric juice, a most important digestive ferment. Eating more frequently than three times a day would be likely to keep food constantly in the stomach. Too frequent eating, as well as overeating, is a prolific cause of dyspepsia.

Dilatation and Prolapse of the Stomach.

Enlargement of the stomach is usually referred to as a dilatation. It is the most common derangement to which the organ is subject in dyspepsia, and makes life miserable for a great many people.

Dilatation of the stomach is usually accompanied by prolapse, that is, a dragging down of the organ. Normally, the lower border of the stomach should lie well above the navel, and the bulk of the organ behind the lower ribs of the left side.

When the stomach is dragged down and enlarged, its digestive ability is seriously impaired. The walls become thin and weak, and the organ is not able to grasp the food and manipulate it, and then empty itself. Hence digestion is retarded, and food remains in the stomach for hours, producing a dull, heavy feeling which is most uncomfortable.

Fomentations to the stomach, with trunk exercises, and abdominal massage, together with proper diet, are the procedures to adopt.

The wearing of corsets is a frequent cause of stomach prolapse, and a healthful mode of dress is essential to its cure.

Ulcer of the Stomach.

Like the mouth and other organs, the stomach is liable to ulceration. The symptoms are those of dyspepsia. There is sharp, burning pain in the region of the stomach, which is aggravated by taking food. Local tenderness may be present. Vomiting is the rule, and is often very persistent. Dark blood, of the colour of coffee grounds, indicates bleeding in the stomach.

The treatment consists of absolute rest in bed, and rectal feeding, with light tonic measures, such as tepid and cold sponging, mitten frictions, and massage to the extremities and back. All manipulation of the abdomen, especially in the vicinity of the stomach, must be strictly avoided. Hot leg packs draw away the blood to the extremities, and thus reduce the local inflammation; cold may also be applied to the stomach to check the bleeding. Rectal feeding gives the stomach a much-needed rest, so that healing can take place. Peptonised milk, well-beaten egg, and some of the specially prepared foods, such as malted nuts or malted milk, may be given.

In mild cases, of course, rectal feeding is not necessary. But the diet should be well supervised, and be confined to milk and water, buttermilk, junket, bean and lentil broths, raw and soft-boiled eggs, barley and gluten gruels, and similar articles. Solid food should not be taken till some weeks after all the symptoms have disappeared. A physician should always be called in.

Cancer of the Stomach.

This is rarely met with before forty. The symptoms are usually striking, especially the weakness and general emaciation. There is also considerable pain, and bleeding is not infrequent. The duration of the disease is not long, seldom over two years.

Everything possible should be done to relieve the pain and distress, and maintain the nutrition of the patient. In the later stages, rectal feeding may be necessary.

The diet should be light, consisting of easily digested food, similar to that recommended for ulcer of the stomach.

Biliousness.

The stomach is as much affected as the liver in the average bilious attack. Probably, in most cases, the catarrh of the stomach extends to the liver, and thus involves both organs. Throwing up a greenish vomit containing bile, is a common symptom. There is also more or less pain and distress, with great nausea.

Use the same treatment as recommended for acute catarrh of the stomach.

Appendicitis.

Pain and swelling in the right side of the abdomen, midway between the navel and the hip bone, with a

moderate fever and constipation, are the cardinal symptoms of appendicitis. Vomiting also occurs. Moving the right thigh aggravates the pain.

The common causes are catarrh of the bowels, irritating foods, foreign bodies, fæcal impaction, and constipation.

Rest in bed, a light fluid diet, and enemata, are the first steps. A dose of Epsom salts may be given. A cold compress or an ice bag, should be applied to the affected part in most cases. At other times fomentations give the most relief

A high temperature, with persistent constipation, fæcal vomiting, and severe pain, indicate the necessity of surgical interference. The physician should be called early in all cases of appendicitis.

Constipation.

This is more of a symptom than a disease. It indicates sluggish action of the bowels generally. The retention of fæcal matter in the bowels gives rise to the absorption of poisonous compounds. A sedentary life, with concentrated food, soon brings on constipation, with such accompanying symptoms as headache, languor, anæmia, and dyspepsia. Hæmorrhoids, or piles, are also likely to develop.

Regulate the bowels by having a set time, preferably an hour after breakfast, at which to empty them. Select a diet which includes the free use of fruit, especially steamed dates and figs, stewed prunes, baked apples, bananas, grapes, oranges, green vegetables, coarse breads, and well-cooked porridges. Toasted wheat flakes and granose biscuits are excellent for costive bowels.

At first, some measures besides the dieting may be re-

quired, and we would recommend enemata in the place of medicines. Both plain and soap enemata are effective. To train the bowels, use the tepid or cool graduated enema, full particulars of which will be found in the chapter on hydrotherapy.

Drink water freely. A glass or two in the morning before breakfast will act as a mild laxative. The same is true of a few juicy oranges.

If it is necessary to take something, use olive oil or castor oil in doses of a teaspoonful to a tablespoonful.

How to Check Diarrhœa.

Diarrhœa is due to an acute inflammation of the intestines, which is usually brought on by wrong feeding. Unripe fruit, decayed food, and especially flesh preparations such as preserved meats, tinned salmon and other varieties of fish, pork, meat pies, oysters and shellfish generally, are the ordinary causes. They often contain poisonous substances which set up an inflammation and so produce the diarrhœa. Contaminated milk is also a prolific cause of diarrhœa, especially in children.

Stop all eating for a few hours, after which the diet should consist of boiled milk, sipped hot, and taken every three or four hours. Wash out the stomach by drinking tepid water, and cleanse the bowels with a full soap enema. Then give cool starch enemata to allay the inflammation. In severe cases put the patient to bed. Fomentations and cold compresses over the abdomen, also neutral sitz baths, are helpful.

Hæmorrhoids or Piles.

Constipation and indiscreet feeding are the chief causes. Constipation leads to straining at stool, which

engorges the blood-vessels, and interferes with the return circulation. Thus the vessels, and especially the veins, become greatly distended and lose their tone and elasticity. After a time the congestion persists, the vessels become permanently swollen and tortuous, and the walls diseased. The hæmorrhoid is really a mass of diseased blood-vessels. In time the walls become so weak through disease that they are no longer able to hold the blood, so that there is bleeding and much pain at stool.

Hot sitz baths give relief, and may be taken before going to stool. But cool or cold sitz baths accompanied by rubbing are the best treatment, if surgical interference is not required. They should be taken daily for several months, if necessary. Small cold enemata, (half a pint or a pint) taken after stool, frequently afford great relief. Witch-hazel ointment, applied locally after a bath, sometimes proves helpful.

In bad cases, where the structures have become much diseased, removal by an operation is the most satisfactory treatment.

To Get Rid of Worms.

It is not an uncommon thing to find tape-worms, or some other kind of parasite, in the intestinal tract. Certain worms can live in the intestines indefinitely, but they could not exist long in the stomach on account of the acid gastric juice.

The way to get rid of worms is to take some medicine which acts as a poison, killing the parasites, which are then soon passed in the stool. It must not be forgotten that the same medicine is also a poison to the patient, and should therefore only be given under the direction of a medical man.

Pin-worms are considered in the section on "Children's Diseases."

Jaundice.

A yellow skin usually indicates a sluggish liver, slow digestion, and constipation. Jaundice is often accompanied by itching of the skin, which is sometimes intense. This may be relieved by alkaline baths.

Restrict the diet and give cleansing enemata. The free use of fruit for a few days will soon bring relief. Apply large fomentations to the liver, and vary with hot liver packs and heating compresses to be worn overnight. Drink water freely—from three to six pints per day.

Hardening of the Liver.

Alcohol in any form has the peculiar effect of hardening the tissues, especially those of the liver. The hardening is due to the excessive growth of fibrous tissue, which supplants the normal, functional tissue, and thus directly interferes with the work of the organ. With the hardening there is also shrinkage, and irregular nodules or lumps often form on the surface. It is then known as a "gin liver" or "hobnailed liver."

Stop the use of alcoholic drinks; take electric light or vapour baths, fomentations, and liver packs; select a simple, non-irritating diet, and drink water freely.

DISORDERS OF THE KIDNEYS.

The kidneys are excretory organs which eliminate the nitrogenous waste from the body. Consequently any interference with their function is likely to be a serious matter. Often one kidney alone is affected; but both may become diseased simultaneously, or one following the other.

Inflammation of the Kidneys.

Pain in the back, about the level of the waist line, with smoky urine, points to kidney mischief. The urine is also scanty, and contains albumen and blood.

Treat the inflammation by hot sitz baths, hot half-trunk packs, fomentations across the loins, electric light baths, and Turkish baths. Such treatments, especially the electric light bath, increase the activity of the skin, and so relieve the kidneys to a certain extent. Drink water in abundance, and restrict the diet. Fruit juices may be taken freely.

The patient must be kept in bed until the inflammation ceases, and there is no longer albumen in the urine. For the diet we would recommend fruit, gruels, brown bread and butter, and well-cooked vegetables of various kinds.

Chronic Bright's Disease.

An acute inflammation of the kidney may persist and develop into Bright's disease, or the disease may be chronic from the beginning. Syphilis and the free use of alcohol are important factors in bringing on an attack. The urine contains more or less albumen, and there is a gradual decline of the health, with loss of weight and strength. The blood becomes impoverished, and digestion is impaired. There may also be dropsy, which gradually increases, and makes the patient very uncomfortable.

The diet should be carefully regulated, and should consist of fruit, breads, well-cooked cereals, vegetables, and nuts. Flesh should be excluded, also eggs and legumes. The patient should be warmly clad and put on the rest cure. A mild, equable climate is best. Tonic and eliminative baths are helpful. Water should be given freely.

Floating Kidney.

This deformity is most common in middle-aged women. Muscular strain, tight-lacing, feeble health, and too frequent bearing of children are some of the causes.

Improve the general health by rest, a wholesome diet, and tonic measures, including proper exercise, and nothing further will be required in many cases. In extreme conditions, a surgical operation may be necessary. Floating kidney is generally accompanied by falling or prolapse of the stomach and bowels. In such cases, a suitable abdominal supporter gives great relief, and helps to bring about a cure.

DISEASES OF THE NERVOUS SYSTEM.

Nervous diseases appear to be on the increase, and "nervous people" are growing in number. Weak and unsteady nerves give rise to many annoying symptoms, and pave the way for insomnia, neurasthenia, and insanity. Weak nerves soon bring general weakness of the various organs, for all the organs and tissues are under the control of the nerves, their nutrition and functional activity, their growth and repair, being thus directed.

Neurasthenia or Nervous Exhaustion.

Put briefly, neurasthenia means nervous debility. The nerves are worn out and exhausted. The patient is excited and fidgety. He is scarcely still a moment, but keeps moving about in a restless way, going from one thing to another in his work or recreation. He is inclined to be cross, peevish, irritable, and ill-tempered.

The brain symptoms are mental depression, headache, sleeplessness, and inability to fix the mind, also hysteria.

There are spinal irritation, pain, and tender spots in the back, with extreme prostration at times. Numbness, tingling, prickling, and hyper-sensitiveness of the skin, are common. Loss of appetite, furred tongue, flatulence, and constipation, are frequently present. The circulation is poor, fluttering and palpitation of the heart occur, and the extremities, especially the feet, are cold.

To Treat Neurasthenia.

Use hygienic measures, tonic treatment, and plain, nourishing food. Exercise is essential. Encourage tennis, golf, riding, driving, and walking. Travel and a change of scene are beneficial. Strict regimen and well-regulated habits, a rest cure, hydropathic remedies, massage, manual Swedish movements, and electricity, are excellent means of strengthening the nerves.

It is obvious that alcohol, tea, and coffee should be strictly avoided by nervous patients. These articles have a specific exciting and irritating effect upon the nerves. Sea-bathing, salt glows, cold affusion, mitten frictions, and cold sponges are useful in many cases.

What to Do for Hysteria.

Women are most susceptible. Worry, overwork, and anxiety, combined with a nervous temperament, are predisposing and exciting causes. There are seizures which resemble true epilepsy; but the patients do not really become unconscious, and manage to fall so as not to be injured. They scream and sob frequently, and are always very sensitive. Perversion and loss of sensation, such as temporary blindness or deafness, are noted at times. There are also local pains and aches, and tender spots.

Hysterical patients are likely to receive too much

attention, which only aggravates the disorder. Endeavour to divert their minds from themselves and their troubles.

There are often definite underlying causes, and these should be removed as far as possible. Seek to build up the general health, which is usually poor and run-down. Use tonic treatment, and get a change of surroundings if possible. Be firm in dealing with patients; but always gentle and kind. Some will endeavour to take advantage and deceive, and will be very trying at times. Nevertheless, the physician and nurse must never lose temper or get angry. There is then no possibility of controlling the patient.

Migraine or Sick Headache.

Sick headache, like hysteria, is much more common in women than in men. Sometimes it appears to be inherited. Some of the predisposing causes are female weakness, disorders of digestion, poverty of the blood, worry, and excessive mental and physical strain. Indiscretions of diet and dyspepsia seem to be important causal factors.

The attacks are often periodic, coming at irregular intervals. They begin with feelings of weariness and discomfort. There is sharp, severe pain of a cutting or stabbing nature. The front, or side, or top of the head alone may be involved. A dark room and quiet rest, with no food or only a little mild fruit during the worst pain, suits the patient best.

Active measures should be taken at the first premonitory signs of the attack in order to avert it. Give the patient a hot leg bath or leg pack, with fomentations to the spine, and plenty of hot water to drink. Apply cold to the head. Give a cleansing enema, and then put her to rest in a quiet, darkened, but well-ventilated room.

During the interval after the attack, endeavour to ascertain the causes and remove them. Insist upon a plain, but nourishing, non-flesh diet, and frequent bathing. The diet is of the greatest importance, for there is good reason to believe that wrong diet is the real cause in most cases. Uric acid, which is found in considerable quantity in animal flesh, is now recognised as an important factor in migraine.

Giddiness or Swimming in the Head.

Many people, as age advances, become subject to attacks of dizziness. Indeed, it may be met with at any age of life, and is really a symptom of some disease, such as congestion of the brain, hysteria, diabetes, or organic disease of the brain or spinal cord. It is frequently seen in epilepsy, either before or following the attack.

To treat dizziness, turn to the causes, and remove them as far as possible. The patient should be instructed to sit or lie down, if possible, as soon as the giddiness begins. A brief rest will usually bring relief.

Epilepsy.

In common parlance, epilepsy is known as "fits" or falling sickness. It is, unfortunately, a rather common disease, and heredity seems to have some influence. The fits or convulsions often appear in early life, seldom starting after thirty.

The causes vary greatly. In children, worms and stomach disturbances may provoke an acute attack. If the causes are allowed to continue, chronic or true epilepsy may develop. If one is subject to seizures, an attack is readily brought on by errors of diet, overwork, or worry.

Two Varieties of Epilepsy.

One is a mild form, known in medical language as *petit mal;* the other, a much more severe form, is termed *grand mal.* The latter is usually preceded by some peculiar symptom which serves to give warning. Then there is a scream or cry, and the patient falls to the ground insensible. There is distortion of the face, and the limbs and trunk are stiffly contracted. The patient is likely to injure himself in falling or in throwing himself about, and the attendant should guard against this danger. The tongue and lips are sometimes severely bitten if not protected.

After a few seconds or minutes, as the case may be, the contractions cease, and the patient slowly recovers consciousness. In very severe cases, this may take one or more hours. Now he is exhausted and falls asleep for a time. The muscles are very sore afterwards. He knows nothing of the attack, or of what happened during the fit.

The immediate treatment consists merely in protecting the patient from injury, and giving him rest after the attack. In the intervals, see that he leads a quiet, temperate life under good hygienic conditions. If the general health is poor, build it up by good food, exercise, and tonic measures.

The Mild Form, or Petit Mal.

The mild form is manifested by merely a momentary loss of consciousness, which is so brief that the patient may scarcely notice it. There may also be slight twitching of the muscles. The face becomes pale. Unfortunately, it may lead to the severe form, hence prompt hygienic measures should be taken to prevent further development, and, if possible, effect a cure.

Before leaving this interesting disease, a word should be said about the vast importance of diet, combined with physical culture, in epilepsy. A young man of the writer's acquaintance, having a poor physical development, was subject to fits. Medical treatment failing to cure him, he set about to cure himself by strict dieting and an out-of-door life. Walking was his chief exercise, and he lived largely on fruit, bread, and nuts. The abstemious diet, together with the natural life, speedily produced a permanent cure, and the man has now been free from epilepsy for many years. In fact he has developed unusual strength and endurance.

All epileptic patients would do well to adopt a plain, abstemious diet, be especially careful to avoid over-eating, and go in for physical culture in earnest.

Paralysis.

This is an interference with motion, and may be one-sided or double. One-sided paralysis, or *hemiplegia*, may be due to a stroke of apoplexy or a tumour in the brain or spinal cord. Apoplexy is due to the bursting of a blood-vessel, whereby bleeding takes place and a clot is formed. This clot presses on the brain matter, and thus interferes with the nerves supplying the muscles. Of course the vessels are previously diseased, as explained in another section of this chapter, otherwise they would not break.

The treatment consists of good hygiene, with electricity and massage applied to the affected parts.

Diseases of the spinal cord may cause double partial paralysis, which, unlike hemiplegia, develops slowly, taking sometimes years before the lower limbs become entirely useless. Again the treatment must be hygienic and tonic in nature, careful attention being given to diet.

Locomotor Ataxia.

This term practically means inco-ordination in walking, and is chosen because it is one of the characteristic symptoms of the disease. With the inco-ordination there is serious interference with nutrition and sensation. The eyes, too, are involved sooner or later.

The disease usually develops slowly, beginning with disturbance of co-ordination. Sooner or later the patient finds that he cannot stand alone on closing the eyes. He may first notice this when washing his face or walking in the dark.

The walking is peculiar, for the patient lifts his feet high and then throws them forward; bringing them down with sole first in a very noisy way. Still, curiously enough, there is no real loss of power in the early stages. He only fails to use his legs properly.

Lightning Pains.

The pain in the limbs and trunk is oftentimes excruciating and unbearable. In the lower limbs the pains appear to shoot up and are exceedingly sharp. They come in severe paroxysms, and are almost unbearable.

In the trunk the pain manifests itself as a girdle sensation. Here, too, it is very severe and the awful sense of constriction may cause the patient to cry out with the paroxysm. Numbness, tingling, prickling, and so-called "pins and needles" sensations are noted in the skin. Certain areas may lose the sense of feeling.

The outlook for the future is anything but bright. Sometimes, by tonic treatment and regimen in a well-regulated sanitarium or hydropathic, good results may be obtained. Travel and sea voyages can be recommended.

To relieve the pain use fomentations, hot packs, and counter-irritation. Electrical treatment, combined with baths, spinal douches, massage, and Swedish manual movements, give best results, and sometimes the progress of the disease is temporarily checked, or a kind of cure is effected.

As to causation, syphilis and alcohol are doubtless the most important factors.

Writer's Cramp.

The symptoms consist of inability to grasp pen or pencil or do any writing. There is pain and fatigue of the muscles, which tremble or involuntarily contract when the pen is grasped. Rest brings immediate relief in most cases, and, if sufficiently prolonged, and combined with general tonic measures, local massage and applications of electricity may result in a cure. But writer's cramp is an obstinate disease to deal with, and a relapse is likely to occur. Build up the general health by good hygiene and nourishing food.

Hydrocephalus, or Water on the Brain.

This disease may appear at any time of life, though it is most common in children. It is characterised by a large head, which is due to accumulation of water in the ventricles of the brain.

The ordinary form develops gradually from birth or early infant life, and the future outlook is unfavourable as a rule. The causes are unknown.

The skull enlarges and the face comes to look small, while the eyes protrude. In extreme cases the skull gets so large that the neck is no longer able to support it. For such patients a suitable frame for supporting the head should be secured.

The intellect is blunted usually, and convulsions may develop.

There is little treatment except careful nursing and good hygiene. Tapping may give temporary relief.

CONSTITUTIONAL DISEASES.

We have now to consider a variety of diseases which appear to involve the whole body more or less, and are consequently known as constitutional diseases. With the exception of diabetes, which we shall consider first, the disorders treated in this chapter are sometimes known as uric acid diseases. These latter are believed to be caused by the accumulation of uric acid in the blood and tissues.

Sugar Diabetes.

As the term indicates, this disease is concerned with the sugar of the system. Under healthy conditions no sugar is passed in the urine; but in this malady the urine always contains sugar, and sometimes a large quantity. The fault, after all, is not really in the kidneys. However, we know very little absolutely as to the real nature of the disease.

The diagnosis is easily made by analysing the urine. The causes are not well known, but poor food, over-eating, physical and mental strain, and worry predispose.

There is a marked loss of strength with emaciation, while hunger and thirst become unnatural. Constipation is the rule. The urine is much increased in quantity, reaching several gallons per day in extreme cases. The skin gets rough and dry, and often itches intensely. There are also headache and mental depression, and sometimes impaired vision.

Treatment of Diabetes.

Restrict the diet, especially in respect of sugar and starch. Eggs, milk, legumes, greens, lettuce, Brussels sprouts, celery, cauliflower, French beans, green peas, spinach, ripe olives, buttermilk, skim milk, junket, and curd cheese (fresh) may be taken. Such fruit as lemons (lemonade), cranberries, sour oranges, cherries, and plums are not objectionable. All nuts, except Italian chestnuts, may be taken freely. Gluten bread and biscuits should be used in place of ordinary bread, and saccharine or saxine in place of sugar.

Such hygienic measures as moderate exercise, salt baths, oil rubs and massage are desirable. Warm underclothing and an abundance of sleep are essential.

There is no drug that can be looked upon as curative.

Rheumatism.

Of all chronic diseases rheumatism is the most prevalent. The predisposing cause is the accumulation of uric acid and other poisons in the body. The investigations of Dr. Haig and others have thrown much light on this and similar diseases. He has clearly shown that tea, coffee, and flesh foods are important factors in bringing on an attack of rheumatism. Under ordinary conditions some uric acid appears to be formed in the body. But by taking flesh one also takes a considerable amount of uric acid and similar bodies, which occur as organic wastes. These harmful extractives are always found in animal flesh, even though there may be no evidence of disease.

Muscular Rheumatism.

Rheumatism may affect either muscles or joints. There is pain and tenderness, the muscles get hard and

rigid, and there is often a temporary loss of function. As explained above, the underlying *cause* is a clogging of the blood and tissues with uric acid. The most important of the immediately *exciting causes* are exposure to cold and wet, severe muscular strain, and over-work.

Wry-Neck, or Torticollis.

This is a deformity in which the head is twisted and bent over to one side. The slightest movement causes severe pain. It must not be confused with Spasmodic Wry-Neck, which is a nervous disorder and comparatively rare.

Treat with fomentations, neck and shoulder packs, and give the muscles complete rest. After the pain has passed, use electricity, massage, and active and passive movements to strengthen the muscles, and restore the natural position of the head.

Lumbago.

This form of rheumatism is manifested by a dull, heavy pain in the back across the loins. Relief may be obtained by fomentations, hot trunk packs, and hot hip baths.

Pleurodynia, or Intercostal Rheumatism.

There is intense pain in the muscles of the chest. One or both sides may be affected. The pain is intensified by coughing, deep breathing, or any movement of the chest. The intercostal muscles are tender to pressure. There is no fever.

Heat, again, in the form of fomentations and packs, will quickly relieve the distress. The muscles must have rest, and this is best accomplished by strapping the affected side.

Chronic Articular Rheumatism.

The development of the disease is slow and gradual. The ligaments and fibrous tissue about the joints are gradually thickened until movement and function are interfered with. The neighbouring muscles waste away after a time from disuse.

As a result there are pain, rigidity, deformity, and creaking. One or more joints may be involved at the same time. Inclement weather, rain, and storm intensify the trouble. In the course of time the joints swell and become tender.

Chronic rheumatism may last indefinitely. The outlook for an early cure is usually unfavourable, though, by dieting and rational treatment, much can be accomplished.

Regulate the diet. Go in for bathing. A course of hydrotherapy is the best cure. Careful attention should be given to clothing and exercise. The climate is also an important factor. A rheumatic patient will do best where the air is dry and clear. Much moisture, and cold, damp weather aggravate the affected joints.

Gout.

This is generally looked upon as the "rich man's disease," but one should not forget that there is also the "poor man's gout." The chief causes are a sedentary life, alcoholic liquors, and errors in diet. The whole body, as a rule, is run down and in a feeble condition.

As in rheumatism, the blood and affected tissues are more or less saturated with uric acid. The patient must be put on a strict diet, free from alcoholic drinks, as well as animal flesh, and tea. It is a good rule to drink water freely—from three to six pints a day. Baths are exceedingly helpful, especially the electric light, Turkish, and

Russian baths. By means of the hot bath active perspiration may be brought on, which always gives relief.

Obesity.

This is also a constitutional disease, usually brought on by sedentary habits combined with high living. The abnormal flesh is largely fat, and is a decided disadvantage. The object is to reduce flesh and, at the same time, increase the patient's strength. This may be accomplished by a restricted diet, baths, and exercise.

Fleshy people should avoid puddings, pastries, sweets, sugar, white bread, potatoes, beetroot, and such sweet fruits as bananas, dates, figs, grapes, raisins, and prunes. They may take greens, such as Brussels sprouts, cauliflower, spinach, celery, lettuce, legumes, and brown bread sparingly, sour fruits, and occasionally an egg. Gluten porridge, bread, and biscuits may be used. Flesh meats are best avoided.

Take water either very freely, five or six pints a day, or less than one pint. A moderate quantity of water is likely to increase flesh.

Electric light baths, Turkish and Russian baths, hot packs, with a pint of hot water to drink at the same time, are helpful in reducing flesh.

But exercise must not be neglected if the cure is to be successful. Light gymnastics, walking, easy cycling in some cases, riding, golf, and tennis may be recommended. Walking is perhaps the best all-round exercise, and cannot be too highly commended for obese patients. Of course, it and other exercises must always be taken in moderation. Overdoing might be dangerous, by producing a strain on the heart. The latter organ is usually weak in patients afflicted with obesity.

DISEASES OF THE SKIN.

The skin, in common with other organs of the body, is subject to a number of diseases, which take various forms, sometimes involving the sweat glands, at other times the hair, or the surface layers of the skin. We can only consider a few of the more important ones.

Pimples and Boils.

Both pimples and boils are a local inflammation of the skin or of deeper tissues. There are redness, pain, and swelling. The cause is infection with germs, which produce pus or matter. The germs enter from without through some abrasion of the skin, or possibly, by way of a sweat gland or hair pocket.

If the blood were in a healthy state, the germs would doubtless be destroyed before they could bring about the destruction of tissue. It is noticeable that people in good health rarely, if ever, suffer from these afflictions.

A pimple may be regarded as a small boil, and the latter as a large pimple. The difference is only one of degree.

The Treatment.

Treat locally by the application of heat or poultices to bring the boil to a head. As soon as there is evidence of matter present, lance deeply with a sharp, clean knife, or, better still, have your physician do it. Then cleanse well with hydrozone or some other mild disinfectant, and dress with a piece of clean lint and a bandage. Remember that the discharge is highly infectious.

Local treatment is not required for pimples, as a rule, except bathing and cleansing the skin with a mild soap.

The general health should always receive attention.

A course of tonic treatment and baths at a sanitarium or hydropathic establishment is to be recommended. Adopt a simple, nourishing diet, with abundance of fruit, and get out-of-doors in the fresh air as much as possible.

What to Do for Hives.

As a rule no local treatment is required, but the diet must receive attention, for here probably lies the cause of the attack. Avoid everything that disagrees with you. Be most abstemious for a time, and take a course of baths. Bathing the affected part with a saturated solution of common washing soda will relieve the itching. Drink water freely. Use enemata if necessary.

Warts and Corns.

Corns are produced by pressure and irritation caused by tight or ill-fitting boots, and they often become very painful. Discard or alter the offending boot at once, so as to remove the pressure from the corn. Bathe the feet alternately in hot and cold water five or six times, both morning and evening. If necessary, call a physician to remove the growth.

The appearance, and oftentimes the disappearance, of warts cannot be accounted for. In most cases they may be removed by painting with strong mineral acids, or the use of the knife in the hands of a medical man.

A drachm of salicylic acid in an ounce of collodion is often recommended. This solution may be painted on the corn or wart daily until the offending growth is destroyed. See that the medicine does not reach the healthy skin.

Lice, or Pediculosis.

To rid the hair of lice, shampoo the scalp well with carbolic or green soap, then dry carefully and comb

with a fine comb. Repeat the process in the course of two or three days. In children it is sometimes necessary to cut the hair quite close to the scalp. The scalp should be thoroughly cleansed with soap and soft warm water about once a week, and oftener if necessary. A little ammonia will soften hard water.

Ring-Worm.

This is also a parasitic disease of the scalp that requires thorough and persistent treatment. It is highly infectious; hence the patient should have his own towels, and sleep alone.

The signs of ring-worm consist of scaly, elevated patches of the scalp where the hairs are dry, brittle, and broken. Cut the hair close to the scalp in the affected parts. After removing the loose scales and hair, wash well with green or carbolic soap and soft water. A mercury and sulphur ointment, which can be obtained from any chemist, may be applied to the affected areas. Use tonic measures to improve the general health.

Ring-worm may affect any part of the body, and can always be treated as directed above.

Scabies, or Itch.

This, too, is due to a parasite, which burrows in the skin, producing intense itching. It is contagious, and is contracted from someone similarly affected. There is an eruption of small, pimple-like bodies which contain matter.

Cleanse the affected part with green soap, and then rub in an ointment containing sulphur or naphthol.

Eczema.

Of all skin diseases this is the most common. It takes many forms, some of which are difficult to distinguish.

Eczema is more of a constitutional than a local disease, hence local treatment will rarely produce a permanent cure. General tonic treatment, good feeding, exercise, and an out-of-door life are indicated.

Eczema is an inflammation of the skin which is not contagious. There is redness and slight elevation of the affected areas. Matter may form and discharge, or develop into scales and crusts. There is more or less itching, sometimes intense and almost unbearable.

Eczema is common at all times, from birth to old age. It is usually associated with physical debility, disorders of digestion, anæmia, rheumatism, or gout. External irritants, like exposure to cold or heat, strong soaps, rough underwear, etc., may excite an attack.

There are many forms of the disease, such as dry or moist eczema, the milk crust of the infant, baker's itch, and various other occupation eruptions.

The Treatment.

Persistent treatment and good hygiene will usually bring relief, although it is a very obstinate disease to deal with.

Improve the general health, as already indicated, and follow a tonic course of treatment. Regulate the diet so as to improve digestion, and keep the bowels open. If the patient is gouty or rheumatic, treat those diseases. Avoid everything that might irritate the skin, and so prolong the inflammation. Zinc ointment and carbolic lotions will relieve the itching, also alkaline baths.

The dry scales should be removed by soap and warm, soft water before applying the local remedies. Ointments of resorcin, salicylic acid, and tar are useful at times. Plain zinc ointment frequently gives satisfactory results.

Remove all sources of irritation, and use oatmeal or bran water in washing the affected part.

Acne.

Redness of the skin, enlargement of the superficial vessels, with new growth of tissue, are the signs of *acne rosacea.* The face is usually the seat of the eruption, and the disfigurement is often very annoying.

Some of the causes which favour acne are indigestion, poor nutrition, exposure to heat or cold, intemperance, and female disorders.

Acne is also an obstinate disease to treat; but unless there is considerable overgrowth of the skin, a successful cure may be expected.

Ointments of sulphur and mercury should be applied locally. Electrolysis is recommended to destroy the enlarged blood-vessels. The diet should receive attention, and careful hygiene be followed.

Psoriasis.

This is an inflammation of the skin which is even more chronic than eczema. Psoriasis is distinguished by round patches of skin covered by thin, pearly-white scales, which are sharply limited from the surrounding skin. It may attack people in apparently good health as well as those who are debilitated. Like eczema, it is often associated with gout or rheumatism.

Where necessary, improve the general health. Electric light baths and alkaline baths are helpful. The scales and crusts should be removed, and an ointment of ichthyol, tar, resorcin, chrysarobin, or sulphur rubbed into the affected parts.

The following preparation may be useful:

Acid. chrysophanic., gr. xv.;
Adipis benzoat., - oz. ii.

Apply locally.

Cancer of the Skin.

Cancer usually comes after the age of forty. Heredity is believed to exert considerable influence. Irritation of the affected part appears to be an important factor. This irritation may be due to a broken tooth, a clay pipe, stays, or an injury.

As soon as suspected, consult a surgeon, so as to undergo an early operation if advisable. If all the cancerous tissue is removed, the outlook is favourable. Otherwise a recurrence is sure to take place, and a second, or even a third operation may be required.

FEVERS AND THEIR TREATMENT.

Fever is characterised by a rise of temperature. In health the temperature of the body is very constant, and stands at 98.6° Fahrenheit when taken in the mouth. A rise of only two degrees produces a mild fever, while a temperature of 103° to 105° is a high fever and dangerous. The rise in temperature is accompanied by a rapid pulse and rapid breathing. There is an increase of waste formation in the body and, at the same time, the eliminative organs act sluggishly.

The fever is really a fire, the body seeking in this way to get rid of poisonous wastes which have probably been accumulating for some time.

The Eruption.

Most fevers are accompanied by a characteristic eruption on the skin, which may vary according to the severity of the attack.

It is curious to note that fevers usually confer a sort of immunity. A person who has had one attack is not likely to have another. This is particularly true of mumps, typhus fever, scarletina, smallpox, and measles. But there are exceptions, persons having been known to suffer from two or three attacks of measles.

Fevers Are Infectious.

Scarlet fever, whooping cough, measles, mumps, etc., are catching, and it is necessary to isolate the patient in order to prevent the disease from spreading. Should this not be carried out, and a number of people take the fever, it is called an epidemic.

The death-rate varies according to the severity of the particular epidemic, and the susceptibility of the patients.

Treatment of Fevers.

If the patient is to be treated at home, select a quiet, pleasant, well-ventilated room at the top of the house, and remove all but the necessary furniture. It is best to send the patient to the fever hospital if proper facilities for nursing are not at hand.

Put the patient to bed, and give absolute rest. Adopt a fluid diet, and encourage the patient to drink freely of pure, soft water.

Sponge the body with cool or cold water or dilute alcohol, and dry gently. See that plenty of fresh air is constantly supplied. This precaution is of the utmost importance to a good recovery.

To lower the temperature, give cold applications, such as the cold sponge or wet hand rub, also cold compresses, cold packs, and cool sitz or full baths.

Drugs are of questionable value for fevers, the water treatment being much more satisfactory.

A brief time—a few hours to a week or longer—intervenes between the time of exposure and the development of the disease. In medical language this is known as the *incubation period*, and it is fairly constant for the various fevers.

Measles.

This is perhaps the most common of the eruptive fevers. It is a contagious catarrh of the respiratory passages, accompanied by a mild fever, and a rose-red eruption of the skin. Catarrh of the stomach and intestines may also be present.

The incubation period of measles is about two weeks. Then the symptoms commence with a feeling of chilliness, acute catarrh of the nose, cough, and sleepiness. The fever rises to 102 or 103 degrees, and may cause anxiety. The eruption appears on the face about the fourth day, and, after spreading over the body, disappears in about three days. Convalescence goes on rapidly unless there is a relapse.

Isolate the patient at once, and provide good nursing. Restrict the diet. Darken the room to protect the eyes, which are at times severely affected. Cold sponging gives great relief. Cleanse the bowels by the use of enemata.

Whooping Cough.

The characteristic bark is sufficient to identify this prevalent disease. Isolation is required, for whooping cough is very catching. There is catarrh of the throat, and a distinctive whooping cough, which comes in paroxysms. Children are most frequently affected, but adults do not always escape.

About all the treatment required is good nursing and a light but nourishing diet. Tonic treatment favours an

early recovery. Plenty of fresh air is important. Dress the patient warmly. In mild cases it is not always necessary to confine the patient to bed. This question should be decided by the attending physician.

Mumps.

The swelling of the glands on one or both sides of the face presents a striking appearance not soon forgotten. Children are most susceptible, but the disease is contagious to all who have not had it.

Mumps, after an incubation period of one or two weeks, begins with a sensation of chilliness, general discomfort, and a light fever. The swelling begins on one side, the other being affected later, or escaping entirely. There is considerable pain, especially on moving the jaw. The fever and swelling only last about five or six days in favourable cases.

Rest in bed, with a light diet and good nursing, are all that is usually required. Cool sponging relieves the fever, and is very refreshing.

Scarlatina.

The scarlet rash, which appears on the first or second day, accounts for the name. It is also known as scarlet fever. It is an acute disease, and very contagious. The fever is severe, and is accompanied by soreness of the throat. Inflammation of one or both kidneys may occur.

Children are especially predisposed, though anyone is liable to attack who has not already had the fever.

The Symptoms.

The period of incubation varies greatly, running from one to seven days. Then the fever begins with a chill or

sickness of the stomach. Swallowing is painful and difficult. The tongue is coated, but later, after the coating disappears, it is of a strawberry colour. In a short time the fever reaches 104° or 105°, the pulse and breathing are rapid, appetite is lost, there is constipation, and the urine is dark and scanty. The patient usually suffers from a severe headache, and occasionally he may have convulsions.

In mild forms, the outlook is favourable; in other cases the death-rate is often high.

The Treatment.

The treatment should be under the direction of a physician. If at home, keep the patient quiet in bed with good nursing and a light liquid diet. Cool sponges with oil rubs are good measures to employ. Some recommend rubbing of the body with olive oil or cocoanut butter several times a day. Encourage the patient to drink water freely. Fruit juices, especially lemonade and orangeade, may be taken freely.

For a high fever, cold packs, cold enemata, and graduated cold baths are advised.

Diphtheria.

This disease requires the attention of a skilful physician. Children are most frequently the victims. Diphtheria is a germ disease of the throat, with constitutional symptoms, and is very contagious. After an incubation period of from two to ten days, the patient is taken with chills, fever, and a very sore throat. The pulse is rapid, breathing increased, the bowels constipated, and urine scanty. There is difficulty in swallowing and a greyish-white membrane covers the throat.

After a duration of a week to a fortnight, convalescence takes place.

The Treatment of Diphtheria.

Isolation, with rest, a plain nutritious diet, tonic treatment, and careful nursing are in order. If there is danger of the swelling of the throat interfering with breathing, give the patient warm, moistened air to breathe, by means of a steam inhaler or a roll of paper attached to the spout of a tea-kettle, taking care to prevent burning.

Use peroxide of hydrogen or Listerine to swab the throat and rinse the mouth. Warm baths, tepid and cool sponges, oil rubs, fomentations to the throat, and the inhalation of hot vapour are usually the best measures to adopt.

Typhoid Fever.

Perhaps a more common name for this disease is enteric fever. It is a germ disease, and is accompanied by a rose rash, usually confined to the abdomen. It attacks adults more often than children. The infection is usually carried in the water or milk. Boiling would render these articles safe.

The period of incubation is two weeks or longer, after which the fever begins, rising rather gradually to 104° or 105°. The duration of the disease is variable, but usually falls within three to six weeks. There is marked prostration, the patient becoming very weak. The abdomen becomes tender and distended with gas. There is also diarrhœa as a rule.

The patient suffers from headache, delirium, and stupor. On recovery it is a common thing to lose the hair, and the patient is likely to be very anæmic and weak, both physically and mentally, for a time.

Treatment of Enteric Fever.

There must be *absolute rest* in bed, and a bed-pan should be used. Since the discharges from the bowels are the chief source of infection, they should always be carefully disinfected, and thus rendered harmless.

Give a mild, fluid diet. Milk is recommended, and from one to two quarts may be taken each day at intervals of two hours. Koumiss and junket are also recommended. Water may be taken freely. Small pellets of ice allowed to melt in the mouth are very refreshing.

To control the fever, give cold sponges, packs, and graduated baths. Check bleeding by applying an ice bag to the abdomen. After convalescence, a trip to the country or seaside is helpful in restoring strength.

The diet is perhaps the most important consideration, especially in the early stages of recovery. Then the appetite becomes ravenous, and the patient finds it difficult to control himself. One must remember that the walls of the bowels are exceedingly weak after the inflammation, and solid food in any form, no matter how wholesome, is likely to cause a relapse or, worse still, a perforation, which may lead to a fatal issue. Hence it is very important to be firm with the patient, and restrict the eating until all danger is past.

Chickenpox.

Unfortunately, smallpox is occasionally confused with chickenpox and *vice versa*, because of the similarity of the rash in the early stages. Unlike smallpox, it is a mild fever, and rarely causes death. The period of incubation lasts one or two weeks, when the patient is taken with a light fever, and is soon covered with a vesicular rash, which may come in successive crops

during the first few days. There is little distress or suffering. After a week, or very often less, the fever usually disappears, and the patient soon makes a complete recovery.

Rest and a restricted diet, with good nursing, are the essentials.

Smallpox.

For centuries smallpox has been looked upon as one of the great scourges of humankind. It is a particularly loathsome disease. The suffering is most intense, especially at the height of the eruption, when the pustules are forming. Smallpox is an intensely contagious disease, and unless protected by vaccination, old and young are liable to attack. Even vaccination is by no means a perfect protection, but experience goes to show that vaccinated persons are less liable to the disease in proportion to the shortness of the interval since vaccination, and further, if attacked, that they suffer less and are much more likely to recover than is an unvaccinated person.

The Symptoms of Smallpox.

The period of incubation is about two weeks, after which the patient is seized with a severe chill, vomiting, and pain in the lower back. The temperature rises quickly to 104° or 105°. The eruption follows on the third or fourth day, beginning with small red spots on the face and wrists. These are characterised by a hard, shotty feel. The rash spreads over the body; the pustules swell and fill with fluid, which is turned into pus and discharged over the skin, forming disgusting sores, and later, patches of scales.

Further symptoms are rapid action of the heart and lungs, scanty urine, and constipated bowels.

Treatment of Smallpox.

But little can be expected of drugs in the treatment of smallpox. It is of the greatest importance to use all reasonable means of preventing a spread of the malady. Isolate the patient completely, put him on a mild fruit diet, and see that he is well looked after and nursed. Give water and lemonade freely.

To prevent pitting, as far as it is possible to do so, darken the room and cover exposed parts with cloths which have been soaked in carbolic water. Cleanse the mouth and throat with peroxide of hydrogen or Listerine. Bathe the eyes in boracic acid water. Cold packs and baths are recommended for high fever. Cold sponges and wet hand rubs are also beneficial.

In vaccination it is essential to use only pure, fresh virus and observe strict cleanliness, otherwise infection may take place and harm be done.

Erysipelas, or St. Anthony's Fire.

This is an acute, contagious inflammation of the skin, accompanied by fever. The face, especially in the region of the nose, is the usual seat of the disease. The immediate cause is a pus microbe, which gains entrance to the deeper layers of the skin and produces a severe inflammation, which in some cases leads to the formation of abscesses and the discharge of matter. The skin takes on a crimson-red colour, and becomes swollen and hard. There is burning pain, and the unaffected part of the face becomes very unnatural, and pits on pressure.

The patient must be isolated, put to bed, and given a light, nourishing diet. Open the bowels with a warm soap enema. Moist compresses, wrung out of a saturated solution of boracic acid, may be applied to the affected

part to prevent spreading. A physician should always be called in.

Rheumatic Fever.

This is an inflammation of the joints, accompanied by an irregular fever. The heart is often involved, and organic disease of the valves may result. Alcoholism and exposure to cold and wet are predisposing causes. The ligaments and membranes of the larger joints are inflamed, swollen, and painful. The disease spreads quickly from joint to joint, but subsides in one joint before attacking another. There is moderate fever and considerable pain. The patient sweats freely, the perspiration being acid. The duration is indefinite, running from a few days to several weeks.

Put the patient to bed between blankets in an airy, cheerful room, and give a light fluid diet, without flesh food in any form, or tea or coffee. Encourage the patient to drink freely of water or lemonade. Give soap enemata to relieve the bowels. Fomentations and hot packs to the affected joints will afford relief. Sponge the body with tepid water to remove the sour sweat. The patient should be under the care of a physician.

ALCOHOLIC AND OTHER INTOXICATIONS.

An intoxication is a poisoning of the body by alcohol, opium, or other drugs, or by poisonous foods. The poison may be taken in small quantities or medicinal doses for years before producing much apparent effect upon the body; or in larger amount, bringing on a severe and sudden attack. The degree of tolerance of which the body is capable, is truly marvellous. But there is a

limit which, when reached, marks the breakdown of the human machine.

Alcoholism.

The use of alcohol in any form is productive of harm to the body. Alcohol is a nerve poison. Its tendency is to shorten and destroy life. Although the drinking of alcohol is merely a habit at first, in many cases it finally develops into a disease known as alcoholism, which thoroughly enslaves its victims, weakens the various organs of the body, and so becomes the means of shortening life, and also making it most miserable.

As explained at greater length elsewhere, alcohol is not a real food, because it does not add to the amount of efficient energy. On the contrary, it diminishes energy, and reduces animal heat. The temporary glow of warmth which one feels on taking a glass of whisky, is due, not to the production of more heat, but to the enlargement of the cutaneous vessels, and the rush of blood to the skin. But this is at the expense of the internal organs, and the consequences of such a disturbance may be very serious, leading in some cases to a chill of the liver or kidneys.

The characteristic symptoms presented by a confirmed drunkard are so well known that we need not mention them.

Treatment of Alcoholism.

The most efficient treatment is to stop the drinking and, at the same time, give up tobacco, tea, and flesh foods. Do it at once, and not gradually, the latter course only prolonging the discomfort and suffering. By also avoiding stimulating food, the body sooner acquires a more natural state, and perverted appetite is more quickly corrected.

The cold shower bath and spray, salt glows, mitten frictions, neutral and tepid baths, electricity, and massage, are all helpful in overcoming the pernicious habit and its consequences. If the heart is weak, it is well to consult a physician.

The Morphine and Cocaine Habits.

Morphine and opium have been used for scores of years to deaden the nerves, and cover up pain and discomfort. For centuries the Chinese and other Orientals have smoked opium. The use of morphine, which is prepared from opium, has increased enormously, until "morphine fiends" are by no means uncommon.

Cocaine, too, has its devotees, and is responsible for much suffering and misery. It is well nigh impossible to give up either habit without medical assistance or confinement in an institution. A course of tonic baths, massage, physical culture, and an outdoor life, with plain, non-stimulating food, are the proper means to employ.

Lead Poisoning.

Painters, those engaged in the manufacture of type, and others handling articles made of lead, are subject to chronic poisoning of the system. Absorption of lead is the cause. The use of water containing lead produces the same results. The lead taken into the system tends to destroy the muscles, and produce inflammation of the nerves. Prominent symptoms are constipation and digestive disturbances, bloodlessness, headaches, and pains in the large joints. Later, paralysis develops, and there is serious brain disturbance. The wrist-drop is characteristic of chronic lead poisoning.

If possible, change the occupation, and if the disease has not already progressed too far, the symptoms will

gradually disappear. Sulphur baths are to be recommended, also the electric light bath, hot joint packs, fomentations to the abdomen, half trunk packs (lower trunk), electricity, and similar measures. The diet should be wholesome and nourishing.

Arsenical Poisoning.

This is also a trade disease, and is only met with in those who have been engaged in arsenic works or where arsenic is present. The symptoms are somewhat similar to those of lead poisoning, and include bloodlessness, emaciation, physical weakness, and catarrh of the stomach and bowels. There may also be loss of hair and paralysis.

To treat, remove the cause and follow tonic measures similar to those recommended for lead poisoning.

Food Poisoning.

In considering this subject we shall see that the chief source of poisoning lies in animal foods, such as oysters and shell-fish in general, tinned fish and meats, pork pies, sausages, and other meats. Various poisons, known as ptomaines, are the active agents in producing the sickness. Milk, cream, butter, and cheese may at times contain a poison called *tyrotoxicon*, which is also a ptomaine. All these poisons are exceedingly dangerous, and not infrequently cause severe illness and even death.

The attack comes on soon after eating the poisonous food, and usually begins with a severe sickness, and griping pain in the abdomen. There is a sudden and severe prostration. The patient is nauseated and vomits repeatedly. Diarrhœa is often present, and sometimes stupor and delirium.

Give tepid water freely to wash out the stomach, and a full warm enema. A hot bath will relieve the pain. Fomentations to the stomach and bowels are valuable. A physician should be called at once, as delay may bring serious consequences.

The best and only sure cure in these cases is prevention. Oysters, cockles, and all shell-fish should not be used as food. They can only please a perverted appetite. They are scavengers of the ocean, and often feed on the refuse of towns and cities. Oysters, as well as other shell-fish, have on numerous occasions been the means of spreading typhoid fever, through contamination of the beds by sewage.

CHILDREN'S DISEASES.

Some of the disorders treated in the section devoted to fevers might be counted as children's diseases; but there are other diseases, such as rickets and croup, which are pretty well confined to children, and these we will proceed to consider.

Drugs and medicines should be avoided as much as possible in the treatment. Children are very susceptible to most drugs, and their delicate organs are easily upset and injured. This is particularly true of the digestive organs.

Another chapter is devoted to the feeding of infants; so we need not deal with that question here. But it is well to bear in mind that many of the minor illnesses of childhood are associated, in one way or another, with the feeding. The mother's breast supplies the natural diet for the infant. Afterward give plain and easily digested food at regular intervals and in proper quantity.

Rickets.

The characteristic sign of rickets is softening of the bones. The causes are briefly, bad hygiene and poor food. Remember that rickets is a preventable disease, and it is either through ignorance or neglect that a child becomes weak and rickety. Prolonged nursing is another cause of rickets.

Rickets is usually manifested between the sixth and eighteenth months. The chief signs are softening of the bones, weakness of the muscles, "pot-belly" with digestive disturbances, and anæmia. On account of the failure of the bones to develop properly, both dentition and walking are delayed, and the opening in the skull, just above the forehead (anterior fontanelle), fails to close at the proper time. The child is also more liable to pulmonary diseases, such as bronchitis and pneumonia, and may be subject to convulsions.

For treatment, send the child to the country, if possible, where it can have fresh air in abundance, with pure milk, cream, and other wholesome food. Medicine is rarely required. New milk is preferable to cod liver oil, besides being much more palatable.

False Croup.

There is a mild catarrh of the larynx or voice-box, accompanied by spasms of difficult breathing, which usually come on at night. First, there is a rough, croupous breathing; then suddenly respiration stops, and the child becomes black in the face; in a few moments the croupous breathing returns. The child is usually quite comfortable in the daytime.

Apply heat in the form of a fomentation or rubber hot

water bottle to the neck. Give hot, moist air to breathe. If no heat is available, hold a bottle of smelling salts to the nose, or bring on vomiting by tickling the throat.

Sponging the child with cold water two or three times a day is recommended as preventitive treatment.

True or Membranous Croup.

This is much more dangerous than the false variety; but, fortunately, it is much more rarely met with. Again there are spasms which stop breathing, inflammation of the voice-organ, and a harsh, barking cough.

Vigorous measures are required in treating true croup, or the outcome may be quickly fatal. Send for a surgeon at once. Then give the child hot air to breathe. A simple apparatus is a tea-kettle of boiling water and a roll of paper through which to breathe the moist air. Take care not to burn the child by the steam. A fomentation applied to the neck, or sipping hot water, may prove effective. If these measures do not give relief, an operation should be performed to prevent suffocation.

St. Vitus' Dance.

Girls are more susceptible to this disease than boys, and it is most common between the ages of five and fifteen. The disease is manifested by jerky movements of the limbs and the muscles of the face, usually confined to one side of the body. Excitement of any kind aggravates the symptoms. There is also considerable weakness, with more or less mental dulness.

With good hygienic treatment the majority recover. There must be complete rest from both manual and mental work. Stop all school studies, and send the child to the country or seaside for rest and recreation. A plain, but

liberal diet, with abundance of fruit, is desirable. The bed- and sitting-rooms should be sunny and well ventilated. In extreme cases it becomes necessary to feed the patient because of his inability to control his muscles.

Cholera Infantum and Summer Diarrhœa.

Diarrhœa, nearly always due to errors of diet, is the cause of many deaths among infants and children.

There is constant vomiting of a sour fluid, and violent purging, with offensive stools of a dark or greenish colour. Prostration is rapid and severe. There is much wasting, the skin gets pale and wrinkled, and the eyes hollow, and there is also more or less fever.

Full enemata to cleanse the bowels, a stomach wash, starvation for a day, taking nothing but water; and then beginning with barley water—these are the measures that will relieve most cases.

Encourage the child to drink water freely. Sterilised milk, whey, koumiss (non-alcoholic), plain egg-nog, and thin gluten gruel may be used. Fomentations to the abdomen, hot abdominal packs, soap enemata, and hot water to drink will give relief. Put the child to bed. Being on the feet and running about will prolong the illness and aggravate the symptoms. Be careful not to overfeed. This of itself may bring on an attack.

Worms.

Through the use of impure water, improperly cleansed salads, and poorly cooked food, children often get worms. Thread-worms are the most common. They measure from one-eighth to one-half of an inch in length, and are found in the rectum near the opening. Here they are productive of much distress by causing itching and great irritation.

To get rid of the thread-worms, cleanse the bowel with a soap enema, and then a salt or quassia enema. For the former, take one teaspoonful of salt to four ounces of water. To prepare the quassia, steep a handful of the chips in a pint of water, or half a pound of chips to a gallon of water. Repeat once or twice on successive days to insure success. Camphor ointment (one drachm of powdered camphor to an ounce of vaseline) applied externally will relieve the itching.

Round Worms.

These worms are much larger than thread-worms, and closely resemble earth-worms except that they are pale instead of red in colour. They may be found in the stomach or bowels, and give rise to much irritation. Although well-fed, the child is always hungry and looks starved. Nervous symptoms develop as well as digestive disorders. The worms are sometimes vomited, and have been known to crawl out of the nose or mouth when the child is asleep.

To drive out these worms and also tape-worms, medicine is required, and this should always be prescribed by the family physician. Also adopt tonic measures to build up the general health.

Colic.

This is characterised by a severe, griping pain in the abdomen, and is often due to constipation. Fomentations or dry heat afford quick relief. Give full warm enemata to clear the bowels, and plenty of water to drink. Also take pains to regulate the diet.

Scrofula.

This is also known as tubercular glands. The glands of the neck are usually affected. They swell up and

become tender to pressure. There is general debility and lowered vitality. The patient is poorly nourished, and feels languid, weak, and tired.

Send the patient to the country for pure air and good, nourishing food. Give fruit freely. Regulate the bowels by means of a simple diet. Prescribe an outdoor life and a course of tonic treatment, including massage. By thus improving the general health, the disease will be gradually driven out of the system. If the glands break down and discharge, it may be necessary to call a surgeon and have them removed. Indeed, it is better to have the glands lanced or removed before they break open spontaneously. This will prevent the unsightly scars that are likely to result otherwise.

Convulsions.

Children are much more susceptible to convulsions than older people. An attack of indigestion, growing teeth, worms, a fit of temper, and a number of other causes may bring on an attack.

When the child is taken with a fit, send for the doctor, and in the meantime, give a hot bath. This will usually afford relief.

Bear in mind that convulsions may be of a more serious character, and indicate epilepsy or brain disease.

CHAPTER XXIII.

Hydrotherapy in the Home.

THE treatment of disease by the use of water in one form or another is not a modern discovery. The Japanese, Chinese, and other ancient nations have utilised water in this way for many centuries. The famous Grecian physician, Hippocrates, who lived nearly two thousand years ago, recommended baths in the treatment of physical ailments. However, for hundreds of years during the Dark Ages but little attention was paid to the use of water, and hydrotherapy almost became a lost art. Priessnitz, of Germany, may be regarded as the father of modern hydrotherapy. He was a simple peasant, who, like Sir Isaac Newton, had learned the value of observation. His early experience with water as a remedial agency reads almost like a romance. Later, Dr. Winternitz, of Vienna, and others, took up the supposedly new treatment and developed it. Dr. Kellogg, of the Battle Creek Sanitarium, was among the first to reduce water treatment to a science. He made a large number of careful scientific experiments, the results of which are given in his admirable book, "Rational Hydrotherapy."

PHYSICS OF WATER.

Water occurs in three distinct forms, solid, fluid, and gaseous, and each form is more or less useful in the treatment of various physical disorders. Ice is used both



NATURE'S HYDROPATHIC.

externally as a tonic, and internally to relieve nausea and vomiting. Water is used for baths, compresses, packs, enemata, etc. Steam is rarely, if ever, used directly; but the vapour which condenses when steam is cooled, is utilised in giving Russian or vapour baths.

Properties of Water.

The two great and all-important properties of water are (1) its ability to absorb and give off heat, and (2) its power to dissolve matter.

A given quantity of water is capable of absorbing more heat than any other known substance, and consequently, it is made the standard of "specific heat," and other things are compared with it.

The body, since it contains such a large proportion of water (about 70 per cent.), also possesses a high specific heat—·9 compared with water as 1.

Water a Universal Solvent.

Water is truly a universal solvent, and this is one of its most striking properties. To a greater or less degree, all things come under the dissolving influence of water. This solvent property makes water a detergent, that is, a cleansing agent. It cleanses everything, cleanses the body, not only externally, but also internally. We shall have more to say about its internal effect in a later paragraph on water drinking.

Water as a Conductor.

Water is only a fair conductor of heat, and not nearly as efficient in this respect as the metals. Copper, for example, is one hundred times better as a conductor of heat. Water makes a relatively better conductor of elec-

tricity, although here again it is far inferior to copper. Water electric baths make a pleasant and oftentimes efficient remedy in the treatment of certain nervous disorders and other diseases. The galvanic and faradic currents are most frequently used for this purpose.

Hot and Cold Relative Terms.

We cannot say absolutely that one thing is cold and another thing hot. An article may feel cold when compared with one object, and warm if compared with another. Water at 90° feels decidedly warm to the hand which has just been dipped in ice-cold water, but cold to the hand that has been held in water at 120°. Hot and cold, then, are merely relative terms.

PHYSIOLOGICAL EFFECTS.

We shall endeavour to deal with the physiological effects of the various procedures later as we describe them, but, on account of lack of space, we can only do so briefly.

The Reaction.

A few words in explanation of what is called the "reaction" will not be out of place here. The reaction is not a single physiological phenomenon, but rather a complex group of such phenomena.

Reaction may be briefly defined as the series of vital phenomena which follow the application of heat or cold to the body. The reaction to cold applications is always most marked and characteristic.

In a word, cold, through the reaction that sets in, warms, while heat cools the body. Nevertheless the immediate effect of all cold applications is to blanch the skin and chill the body. When the reaction occurs,

the secondary effects are realised; namely, dilatation of the cutaneous vessels, causing a glow of warmth.

Results of Incomplete Reaction.

To produce satisfactory results, the reaction must be quick and complete. Otherwise, most unpleasant symptoms may occur, such as giddiness, faintness, nausea, and general weakness. The immediate chill is prolonged, the skin remains cold and pale, and more or less depression follows. The finger-nails are blue, and often the fingers get quite numb and stiff with the cold, and chills creep up and down the spine. All this indicates clearly that the body has not sufficient vitality to react to the cold, making it necessary to resort to other and milder measures.

Classification of Physiological Effects.

The following classification of the effects upon the body of water applications is of necessity exceedingly brief:—

I.—Excitant and Tonic.

A. *General.*
- *a.* Primary.
- *b.* Secondary.

B. *Local.*
- *a.* Primary.
- *b.* Secondary.

II.—Sedative and Depressant.

A. *General.*
- *a.* Primary.
- *b.* Secondary.

B. *Local.*
- *a.* Primary.
- *b.* Secondary.

BATHS.

To one who has not made a special study of hydrotherapy, there is a surprisingly large variety of baths and other treatments, each with its advantages. Many of

these treatments require special appliances and skilful attendants, but a considerable number can be given by the intelligent amateur in any ordinary home.

The Bath-Room.

Every home ought to possess a bath-room of generous size. One measuring eight by ten feet would answer very well. The room should be light, and well ventilated. It should contain a full bath with hot and cold water supply, a lavatory, a movable sitz tub, a foot bath, and a massage table. It should also be provided with a cupboard for towels, sheets, fomentation cloths and blankets, and several hot water pipes for drying the towels. A good bath thermometer is another requisite.

Such an outfit, while quite inexpensive, will be ample for all ordinary requirements.

The Temperature of the Water.

The effects of a bath of any kind depend largely upon the temperature of the water. The following table of temperatures will be sufficiently complete for our purpose:

32	degrees	Fahrenheit	and	less,			Freezing.
32	to 50	degrees	Fahrenheit,				Very cold.
50	" 70	"	"	...		...	Cold.
70	" 80	"	"		...		Cool.
80	" 92		"	...		...	Tepid.
92	" 97	"	"		...		Neutral.
97	" 102	"	"	...		...	Warm.
102	" 105	"	"		...		Hot.
105		"	"	and	above,		Very hot.

Warm and hot baths are more or less weakening. The neutral bath has a mild tonic effect. Tepid, cool, and cold baths give increased tonic effects as the temperature

diminishes. Bathing in water containing ice must be reserved for the robust.

The duration of immersion also influences the effects derived from a bath. A very brief hot bath is really a tonic, but, if prolonged, it becomes relaxing. Cold baths should always be brief; otherwise mischief might result. A cold plunge or dip is a powerful tonic, and produces most exhilarating results.

The Full or Immersion Bath.

This is one of the most comfortable of baths as far as position is concerned. The patient lies on his back in an easy position, and relaxes his limbs and muscles. This relaxation is essential to the most favourable results. The water should cover the chest, and reach to the chin. In giving a hot bath it is well to apply a cold compress to the head. A towel wrung out of cold water may be arranged in the form of a turban. The duration of the bath varies according to the temperature. Five minutes is usually long enough for a hot bath. A warm bath may occupy ten or fifteen minutes.

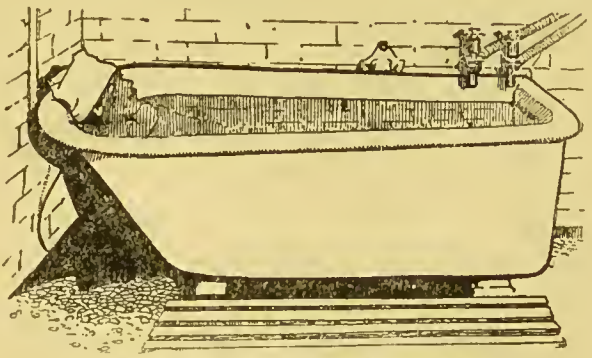


Fig. 90. The Full or Immersion Bath.

On leaving a warm or hot bath of any description, a cold application of some kind is advisable. A cold spray, if available, gives an excellent finishing touch; but simpler means may be used; such as a tepid or cold sponge, a wet

hand rub, or a cold mitten friction. These procedures are fully described elsewhere in this chapter.

Some form of electricity, such as the galvanic or faradic currents, may be given in connection with the water bath, the current passing to the body through the water. This is called a water electric bath, and makes a valuable treatment for certain forms of disease.

The Neutral Full Bath. (92° to 97°.)

The temperature of the water should be about 97° or 98° Fahr. to begin with, and afterward gradually lowered several degrees. As the term "neutral" indicates, the water of such a bath should be neither hot nor cold. The bath is pleasant, producing in the patient a feeling of comfort and well-being. The neutral bath may be prolonged almost indefinitely when required, and then becomes a continuous bath. Such a bath is sometimes useful in treating severe and extensive burns of the skin.

The ordinary neutral bath lasts from ten to thirty minutes, but it may be prolonged to an hour, or even several hours when desirable. It is an excellent means of relieving insomnia, and is effectual in treating hysteria, neurasthenia, anæmia, chlorosis, mild forms of insanity, and various other ills.

If electricity is administered with this bath, it is known as an electric neutral water bath. The interrupted current is most frequently used.

On leaving the bath the patient is well dried, and sent directly to bed if the bath is given for insomnia.

Shallow Bath with Affusion.

The temperature of the water is warm, neutral, or tepid, and the quantity is merely sufficient to cover the

thighs. The attendant applies vigorous friction to the back while pouring on the cold water. Fig. 91.

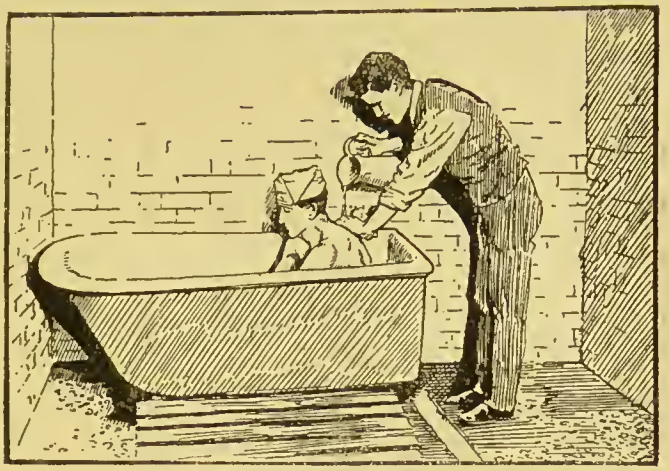


Fig. 91. Shallow Bath with Affusion to the Spine.

The Sitz or Hip Baths.

For these baths a sitz tub is required. The bath may be hot, warm, neutral, or any temperature desired. The hot sitz bath is often indicated for inflammatory disorders of the pelvic organs.

A hot foot bath is usually given with sitz baths. Fig. 92.

The neutral sitz bath is similar in its effects to the neutral full bath, but milder.



Fig. 92. Sitz and Foot Bath.

The rubbing sitz is a tepid or cool bath which is given with vigorous friction to the immersed parts of the body. It may occupy from one to five minutes, according to the temperature of the water. It is recommended for piles, constipation, and pelvic congestion.

An electric sitz bath may also be utilised.



Fig. 93. Hot Foot Bath.

The Hot Foot Bath.

(105° to 120°, 5 to 20 minutes.)

A very simple bath, easy to administer, and efficacious in its results, is the hot foot bath. It may be given in any room of the house. Provide plenty of boiling water. Give the bath as hot as the patient will stand, and add more hot water every few minutes. The patient may drink two or three glasses of hot water or hot lemonade to advantage during the bath. Fig. 93.

Bathe the face and head with cold water, and apply a cold compress to the head. Have a temperature of 105° Fahr. to begin with, and gradually increase to 115° or

120°. If necessary, wrap the patient in a blanket to keep him warm. The bath should continue until there is free perspiration. On taking the feet out of the bath, pour cold water over them and dry well.

A tepid or cool sponge bath, followed by vigorous friction, should be administered at once, after which the patient should go to bed.

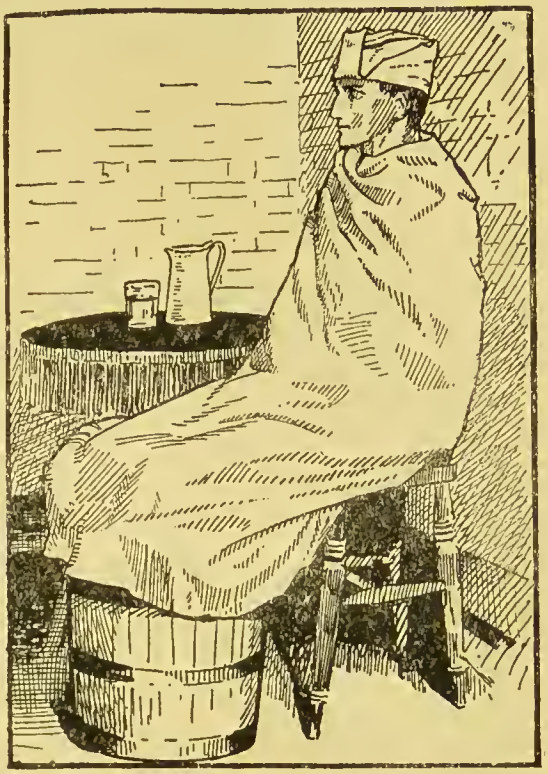


Fig. 94. Hot Leg Bath.

Uses of the Hot Foot Bath.

The hot foot bath is an excellent remedy for a cold in the head, a sore throat, or a mild case of influenza; a sprain or dislocation of the ankle; also for neuralgia, rheumatism, and gout of the feet. By drawing the blood into the lower limbs it acts as a derivative and often relieves a congestive headache. It always helps to equalise the circulation; consequently it is a remedy for cold feet.

By drawing blood from the head, it renders the brain anæmic and so favours sleep. Indeed, it affords great relief in certain forms of insomnia. The hot foot bath is also recommended for dyspepsia and indigestion.

To intensify this bath, two tablespoonfuls of ground

mustard may be added to the water. This is called a mustard foot bath.

The Hot Leg Bath. (105° to 120°.)

For this a deeper tub is required, as the water should reach nearly up to the knees; otherwise the procedure is quite the same as for a foot bath, and the uses are very much the same. Fig. 94.



Fig. 95. The Alternate Hot and Cold Foot Bath.

The Alternate Hot and Cold Foot Bath.

(110° to 120° and 40° to 50°.)

For this bath two foot tubs will be required, one containing hot and the other cold water. After soaking the feet in hot water for two to three minutes, transfer them to the cold water for twenty or thirty seconds, and then back to the hot water. This may be repeated four to six times, after which the feet are dried from the cold bath. Keep up the temperature of the hot water by the addition of boiling water from time to time. Fig. 95.

This bath has a more powerful effect upon the circulation than the plain foot bath, and is one of the best preventitive measures against cold feet, sweating feet, and chilblains.

An alternate hot and cold leg bath may be given in like manner, except that two leg tubs are used instead of foot tubs. Fig. 96.

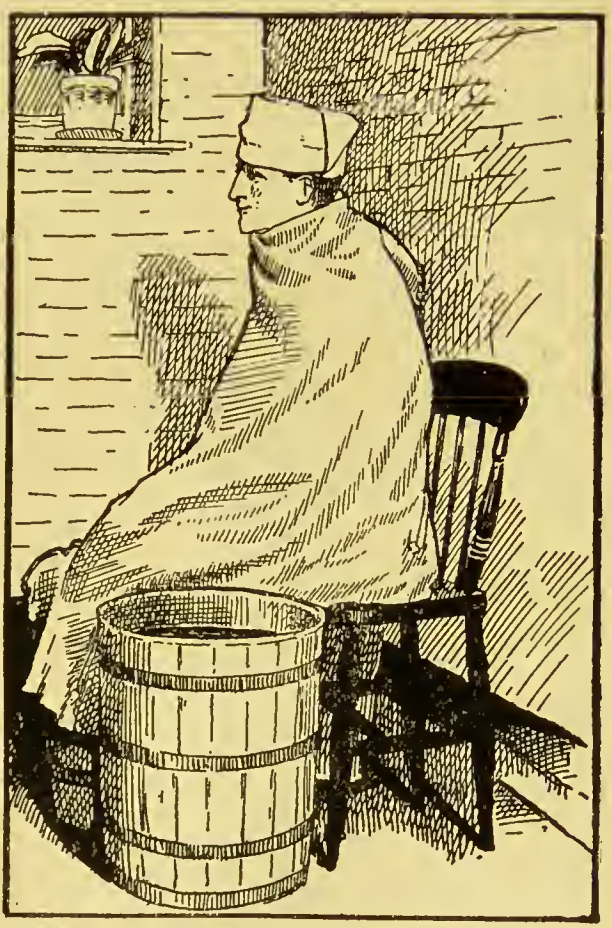


Fig. 96. The Alternate Hot and Cold Leg Bath.

The Arm Bath.

(105° to 120°.)

This is a simple form of bath, and not difficult to give. It is rarely resorted to except for a sprain of the wrist, chronic ulceration of the arm, or extensive burning. The bath may be given in a large basin or other suitable vessel. Fig. 97. If a continuous bath, the arm should be occasionally dipped in cold water for an instant; then returned to the hot bath.

Elbow or hand baths may also be administered for special reasons.

The Hot Air Bath.

(5 to 20 minutes, 120° to 200° Fahr.)

A specially prepared cabinet is useful for the hot air bath, but not essential. The treatment may be given by placing the patient on a cane-seated chair, under which a burning lamp is placed. A piece of metal must be fitted under the seat to prevent burning. The patient is then well wrapped in sheet and blankets, which retain the hot air. But this method is not to be generally recommended, for, even with the best of care, there is always danger of setting the clothing or chair on fire.

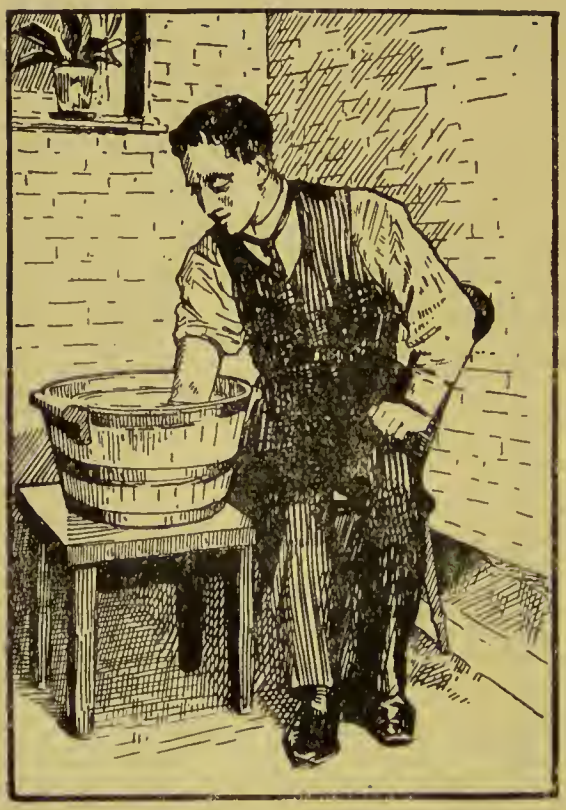


Fig. 97. Arm Bath.

A good cabinet bath is far better, and can be obtained for a reasonable sum. The air is heated by an alcohol lamp, petroleum, or gas, and care must be taken to prevent burning, because, even with the best constructed cabinets, there is still some danger of fire if proper precautions are not observed. Fig. 98.

Have the bath cabinet warm before introducing the

patient. Give a pint or more of hot water to drink during the bath. This facilitates perspiration, and renders the treatment more effective. Bathe the face and head in cold water, and apply a cold compress to the head. This should be changed every five minutes.

The feet may be placed in hot water or on a hot brick during the bath.

The hot air bath is followed by a cold sponge, cold mitten friction, or cold full bath and friction.

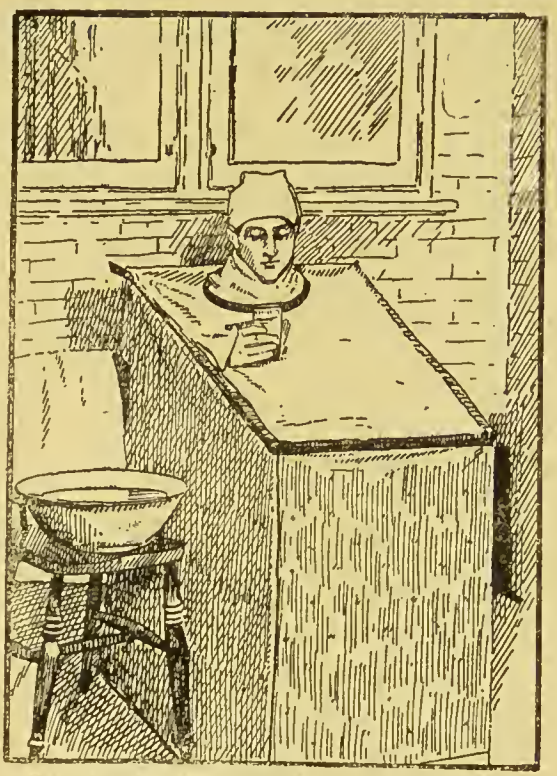


Fig. 98. Cabinet for Hot Air or Vapour Baths.

This is an efficient remedy for a cold, influenza, bronchitis, rheumatic disorders, especially lumbago, sciatica, acute and chronic Bright's disease (except where the patient has reached the advanced stage), and obesity.

The hot air bath is to be avoided in fevers, and where there is extreme weakness of the heart.

The Hot Vapour Bath.

(5 to 20 minutes, 110° to 120°.)

This is similar to the foregoing except that, instead of dry, hot air, there is hot vapour or wet steam. Like

the hot air bath, it is also given in a specially prepared cabinet. By means of a suitable lamp, which goes with the cabinet, water is boiled, and the steam produced furnishes the hot vapour. Again careful precautions are necessary to prevent fire. Fig. 98.

The patient is encouraged to drink a pint of hot water. A cold application, such as the cold mitten friction, the cold spray, or shower, follows the bath, after which the patient is dried, and an oil rub administered if desired.

The hot vapour bath is useful for the various disorders mentioned under the hot air bath, and also for neurasthenia, neuralgia, hypochondria, hysteria, and obesity. But it must be avoided in cases of severe heart or kidney disease.

The Turkish Bath.

This is a hot air bath on a large scale. It is one of the oldest forms of baths known, and was very popular among the Romans before the Christian era. The entire body, including the head, is subjected to the hot air. This is a great disadvantage, for it means the breathing of air made foul by poisonous emanations from the body.

There are usually two rooms, a warm room for the first stage, and a hot room in which to finish off. Attendants are present to administer massage, rubbing, and shampoos. It is customary to drink a pint of hot or cold water before entering the bath, to facilitate perspiration.

After a sufficient interval, varying from ten to thirty minutes, the patient is subjected to a cold shower or spray and a rub down. Then he goes to a cooling room and reclines on a couch for half an hour or more.

The physical effects are similar to those of the hot air bath, both being useful for the disorders enumer-

ated above, and indeed for a large number of chronic diseases.

The Russian Bath.

This is similar to the hot vapour bath. The patient lies on a marble slab in an atmosphere of steam at a temperature of from 110° to 120° for five to twenty minutes. An attendant gives a thorough shampoo, which is followed by a cold spray or plunge and friction.

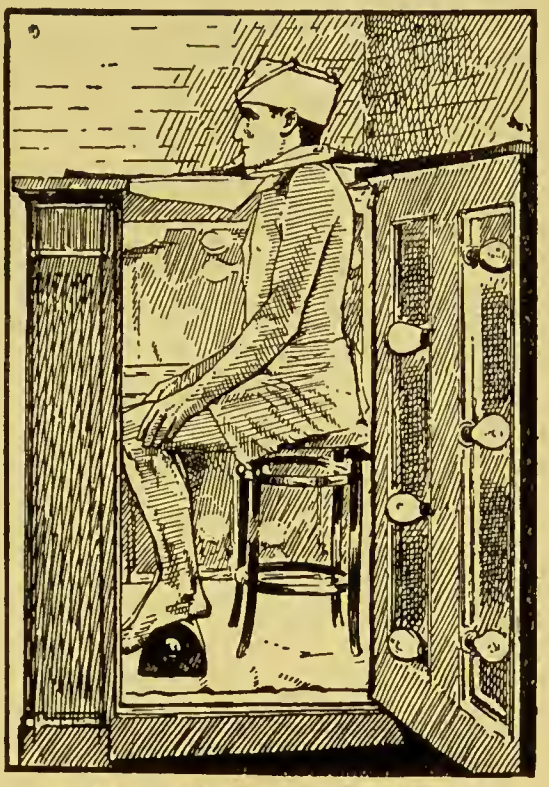


Fig. 99. Electric Light Bath Cabinet.

The Russian bath interferes a good deal with respiration, and is very unpleasant for many persons. The hot vapour has a stifling effect upon the patient, and is often almost unbearable. But in certain cutaneous eruptions this form of treatment is preferable to the hot air bath. It has the same general uses as the latter.

The Electric Light Bath. (5 to 20 minutes.)

This paragon of hot baths is the invention of Dr. J. H. Kellogg. It is the cleanest, pleasantest, and most convenient bath known, and in time will probably displace both

Turkish and Russian baths. It may be administered in either the sitting or the recumbent position, with the head included or excluded as desired ; or it may be administered locally to the spine, abdomen, or one of the limbs. Fig. 99.

There are various forms of the electric light or radiant heat bath, the most common form being a cabinet fitted with ordinary incandescent burners. But the arc light may also be used, as well as red or blue lights, for special purposes.

A cold compress is folded about the head to prevent faintness, and the patient remains in the bath five to eight minutes for tonic effects, and longer for eliminative purposes. On leaving the bath, some form of cold application is always given to the patient to close the pores of the skin and prevent taking cold. An oil rub is a good finishing procedure.

Effects of Radiant Heat.

The radiant energy of the electric light has a remarkably penetrating power, and reaches the tissues beneath the skin with great ease. In this respect it is vastly superior to the hot air or vapour bath.

A brief electric light bath is useful for its tonic effects. These, although mild, are nevertheless very real and effective, the patient feeling exhilarated and strengthened.

When the bath is sufficiently prolonged, the eliminative effects are powerful, heat applied in this form being one of the best reducing agents available. Consequently the treatment is suitable for persons suffering with diabetes, obesity, syphilis, neuralgia, eczema, migraine, neurasthenia, hysteria, and all rheumatic and gouty disorders. It is also useful in anæmia, and in various forms of indigestion, especially nervous dyspepsia.

The radiant heat bath may well be recommended for people engaged in sedentary occupations, for whom it is an efficient preventitive of many ailments.

The Sun Bath.

After all, the electric light is merely resuscitated sunlight, and the ideal bath is naturally the sun bath. This is going back to nature. Sunlight is one of the most powerful hygienic agents within the reach of man. But it is more than a mere hygienic measure, for it possesses great virtue as a healing and curative agent. Sunlight is nature's most efficient disinfectant. The hot rays of the direct sunlight destroy all known germs, and so purify the air and everything within their reach.

Sunlight is also a supporter of life. It stimulates the growth of both plants and animals. Consider what happens to plants when placed in a cellar and deprived of sunlight. And how is it with children who are treated in the same way? The sunlight colours the flowers and leaves, and paints the roses on the cheeks of children and adults as well.

A sun bath may be taken indoors or out-of-doors. If in a room, choose one facing the south that is well provided with windows. This may be called a solarium. Provide a suitable couch on which the patient can lie. The entire body or any part of it may then be subjected to the rays of the sun, and the exposure may last from five to thirty minutes or even longer. It is one of the most pleasant and comfortable of baths.

Uses of the Sun Bath.

The sunlight affects not only the skin, but also the deeper tissues, much the same as the electric light. It

soothes the nerves, warms the tissues, bathing them with light, and exerts a mild, tonic effect upon all the organs of the body. The sun bath, moreover, is restful and promotes sleep.

There is scarcely any chronic disease that is not benefited by the sun bath. It is a potent measure for all forms of malnutrition and digestive disorders. It is invaluable in anæmia, chlorosis, and diabetes. Most nervous disorders, and especially neurasthenia, are improved by this treatment. Obesity, rheumatic disorders, and gout are also benefited by a systematic course of sun baths.

One can take a sun bath daily for a month or longer to advantage. A cold application following the bath is not absolutely necessary, unless the skin has been greatly heated; but it is advantageous under most conditions.

COMPRESSES AND PACKS.

The Compress.

There are many forms of the compress that are used in treating disease, but we shall confine our attention to the most common and useful varieties only. The compress may be defined as an application of water by means of a cloth. Wool, linen, and cotton, especially the first two, are most commonly used. The poultice is really an old-fashioned form of compress, but is less clean and less convenient. It will ultimately fall out of use.

Two to four or six thicknesses of linen, or double the number of layers of butter muslin, may be used. For hot applications flannel is usually preferred.

A compress may be hot or cold, or any intermediate temperature. The degree of heat largely determines the effect upon the body.

The Fomentation.

As the term itself indicates, this is a hot compress. It is one of the most useful of water treatments, and is both inexpensive and easily prepared. According to Dr. Kellogg, "it is essentially a local vapour bath."

Fomentation cloths are readily prepared by dividing an ordinary large woollen blanket into four equal parts.

If the same part of the body is to be repeatedly treated, it is well to oil the skin with cocoanut butter as a protection.



Fig. 100. Fomentation to the Neck.

The patient usually lies on a couch while undergoing treatment, and is covered with a sheet and a blanket. Have a pail of boiling water. Fold the fomentation cloth so that there will be four thicknesses over the part to be treated; again fold once or twice lengthwise; grasp one end of the cloth in each hand, give it a turn or two, and dip in the hot water; then wring out by twisting and pulling the ends apart. The fomentation cloth must be wrung out thoroughly and smartly to save dripping and loss of heat.

Fomenting the Hips.

Suppose the hips are to be treated. Have the patient lie on his face, and place a single layer of dry flannel over the hips, and then lay the fomentation cloth over this. Press it down snugly against the body, and cover with a dry flannel after folding back the ends. This helps to retain the heat. The fomentation is left in place for five minutes and then replaced by another, which is again

retained for five minutes, to give place to a third and final. Each succeeding application is hotter than the previous. They should be as hot as can be borne, but sufficient care should be taken to avoid blistering the skin. Fig. 101.

On removing the last fomentation, the surface treated should present a scarlet red colour. Bathe the part with

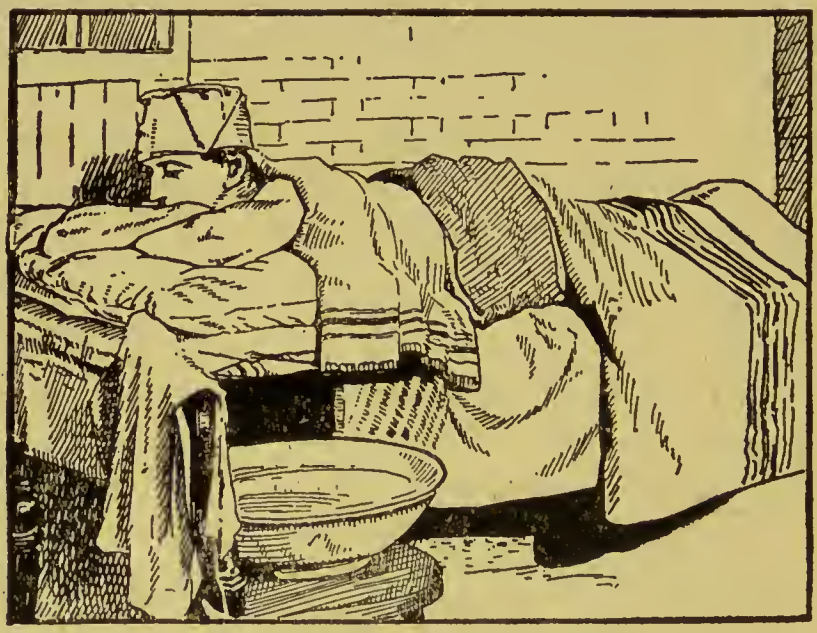


Fig 101. Fomentation to the Hips.

cold water and dry gently. The treatment can be repeated in an hour or after a longer period, according to the circumstances of the case.

Inflammations of all kinds can usually be treated to advantage by fomentations, and these hot cloths can easily be applied to any part of the body. They are most useful in treating acute and chronic stomach disorders, torpid livers, sprains, bruises, dislocations, fractures, renal and hepatic colic, neuralgia, constipation,

rheumatic and gouty joints, lumbago, and many other ailments.

Hot Foot Baths and Fomentations to the Spine.

Oftentimes various separate procedures, such as fomentations to the spine or some other part of the body, are combined with the hot foot bath for the purpose of producing more marked results. The water must be as hot as can be borne, and a cold compress is applied to the head as a matter of course. The duration of the combined treatments is from ten to twenty minutes, being governed largely by the circumstances of the case. Fig. 102.



Fig. 102. Hot Foot Bath.

This makes an efficient means for the treatment of colds and mild attacks of influenza.

The Mustard Fomentation.

To intensify the effect and increase counter-irritation, ground mustard may be added in the proportion of a tablespoonful to a quart of water. The mustard is steeped

in the water, which is then poured over the fomentation cloth, the latter being wrung out as usual and applied to the body. Take care to avoid blistering, especially where the skin is tender and sensitive. The mustard fomentation is very effective in relieving severe pain.

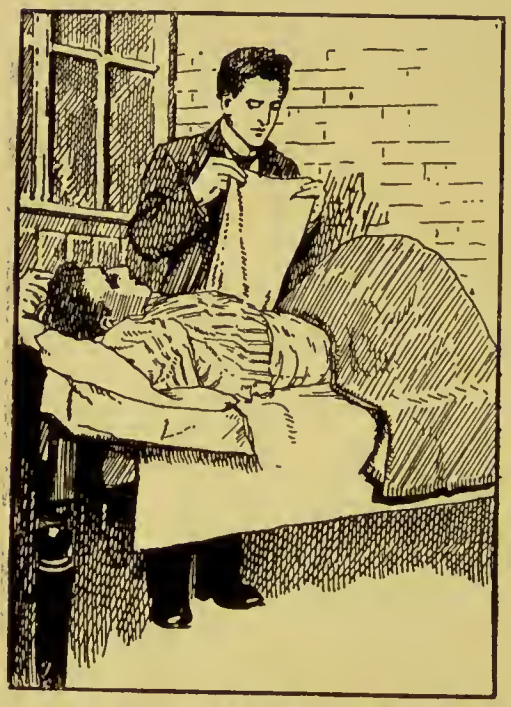


Fig. 103. Wet Girdle or Abdominal Heating Compress. 1st. Step, Applying the Moist Towel.

The Rubber Bottle Fomentation.

Continuous moist heat can easily be provided by placing a rubber water bottle, half full of very hot water, over the fomentation. This saves changing the fomentation every five minutes, and is quite as successful in many cases. Every hour, or oftener, the fomentation should be removed and a cold compress applied for a few minutes, after which the fomentation may be resumed.

The Hot Water Rubber Bottle.

This is a most convenient means of applying dry heat to the body. The bottle should not be more than one-third or one-half full; otherwise it will be very difficult to adjust it snugly to the skin. Press out the air before closing the mouth. The hot water bottle is a simple and effective means of relieving inflammatory affections,

bruises, sprains, neuralgia, rheumatism and similar affections.

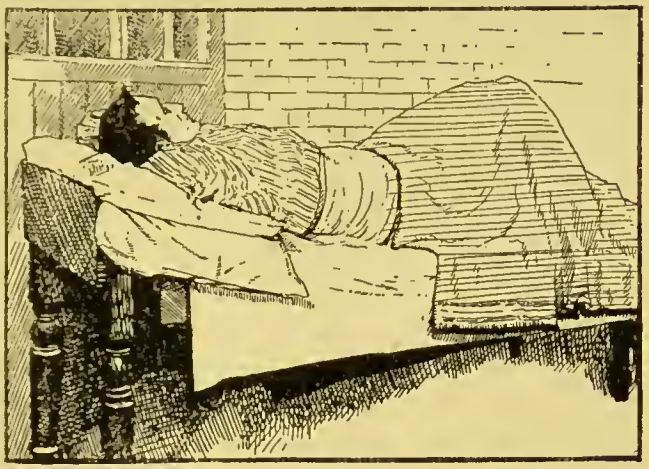


Fig. 104. Heating Compress. 2nd Step, Moist Towel Fastened in Position.

The Heating Compress.

This consists of a linen compress covered with two or three layers of flannel, which overlap above and below, and so hinder the entrance of air and prevent chilling. A linen towel of suitable size serves the purpose very well. Wring it rather dry out of cold water, and apply snugly to the body, say around the chest or abdomen. Then wrap with the dry flannel. It is usually left in place for several hours or over-night. On removing, bathe the part with cold water and dry well. Figs. 103, 104, 105.

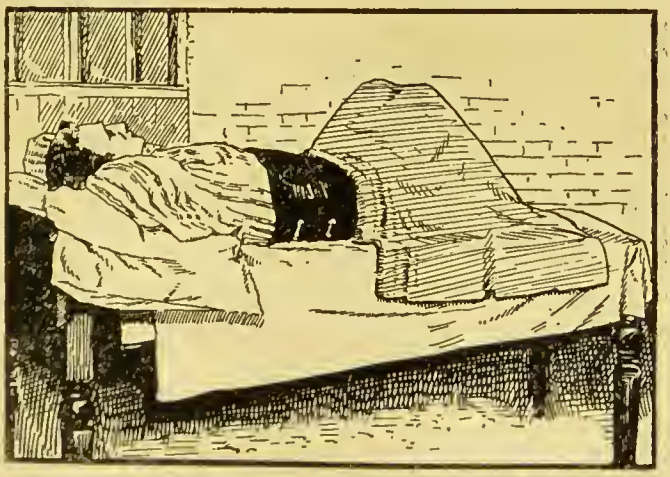


Fig. 105. Heating Compress. 3rd Step, Flannel Band Adjusted.

The physiological effect is to cause a large flow of blood to the affected part. The cold sensation passes away quickly, and is followed by a feeling of warmth and comfort.

The heating compress is successful in relieving chronic catarrh of the throat, chronic bronchitis, and various gastric and intestinal disturbances. Applied to the stomach and bowels, it is called the abdominal girdle (*umschlag*, in Germany), and becomes a most powerful remedy for chronic dyspepsia, intestinal catarrh, constipation, sluggish liver, chronic backache, and prolapse and dilatation of the stomach.



Fig. 106. Cold Compress. Application to the Head.

If used daily, the compress should be boiled between each treatment to keep it clean. Otherwise, it may give rise to an eruption of the skin.

The Cooling Compress.

The compress should be maintained at a temperature of 55° to 70° Fahr. This can be done by frequent changing. The effect is distinctly sedative. It is useful in typhoid fever, and also in certain forms of inflammation.

The Cold Compress.

In giving almost any hot bath or hot treatment, it is customary to apply a cold compress to the head. The procedure is as follows: First, bathe the head and face and also the neck, if desired, with cold water. Next, wring a towel or a piece of linen of suitable size out of cold water, so that it still remains fairly wet, and apply it to the head in the form of a turban. This should be changed for a fresh one as frequently as it becomes

warm; ordinarily, at least every five minutes. It should not be so wet as to permit of water trickling down over the face or neck, which is very unpleasant. Fig. 106.



Fig. 107. Cold Compress to the Neck. The Moist Towel.

The cold compress has a pleasant, soothing effect upon the patient. It prevents faintness, and helps to equalise the circulation of the blood.

The cold compress is also helpful in stopping nose bleeding and other hæmorrhages, and relieves neuralgia better than heat in some cases. It should not be applied continuously for more than half or three-quarters of an hour. Then it should be interrupted by a fomentation for five minutes, which will bring back the natural heat, and prevent untoward results.

Cold Compress to the Neck.

Take a small linen towel of suitable size, and fold it lengthwise, so that the folds are about two or three inches wide. Soak it in cold or ice water, and wring well. Apply it snugly to the neck, and fasten by safety pins. Fig. 107. Next cover the moist towel by two or three thicknesses of flannel, so that the dry flannel overlaps above and below, preventing the access of air. The flannel needs to be applied snugly and fastened with pins. Fig. 108. On removing the compress, bathe the neck with cold water, and dry well.



Fig. 108. Cold Compress. The Dry Flannel Covering.

It is a good plan to apply the cold compress at night, and remove it in the morning. This makes an excellent treatment for chronic sore throat.



Fig. 109. Fomentation Applied to the Spine.

"Hot and Cold" to the Spine.

First apply a fomentation for five minutes, and then a cold compress for thirty to sixty seconds. Repeat three to six times. Finish with the cold compress.

This treatment is very useful for neurasthenia, hysteria, insomnia, and other nervous disorders.



Fig. 110. Hot Blanket Pack. 1st. Step. Wrapping the Moist Blanket about the Patient.

The usefulness of the alternate hot and cold compress is not confined to the spine; it may also be applied to other parts of the body. For bedsores, paralysed limbs, alco-

holic intoxication, and for local exciting and stimulating effects generally, it is a valuable form of treatment.

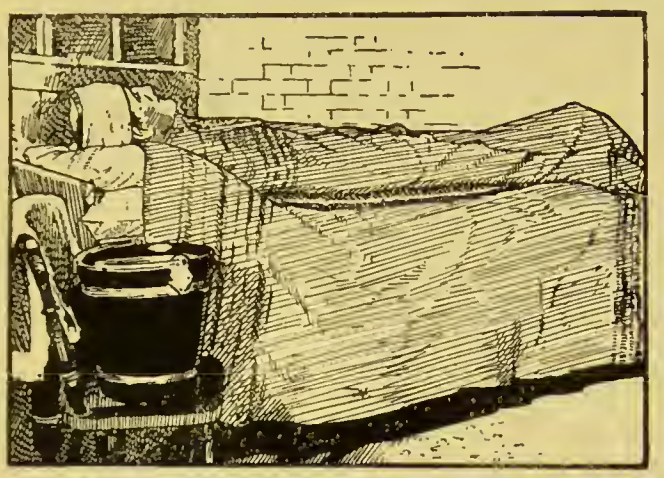


Fig. 111. Hot Blanket Pack. 2nd Step. The Dry Blankets Folded about the Patient.

The Hot Blanket Pack

To give this pack prepare a couch by laying over it, first, a sheet folded once so that it covers half the pillow, and then three or four blankets. Now wring a blanket out of hot water, and spread it on the couch. The patient lies down, and the blankets are, one after another, wrapped about him snugly, especially well over the shoulders and the back of the neck. The sheet is tucked in last. One or two extra blankets are folded and laid over the patient to provide plenty of warmth. A hot

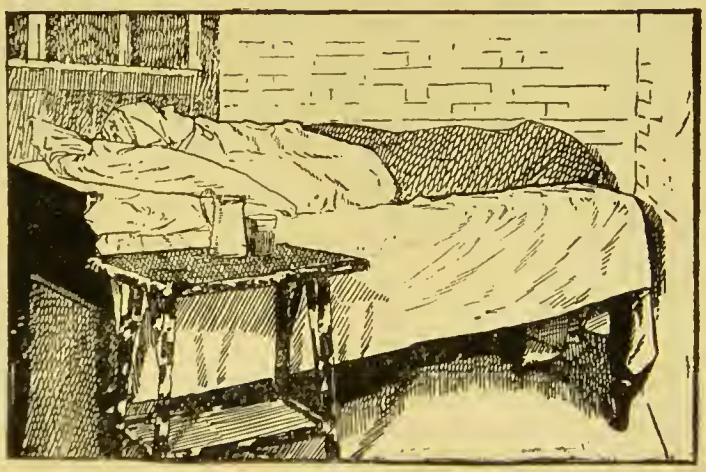


Fig. 112. Hot Blanket Pack. 3rd Step. The Sheet Adjusted about the Face.

bottle is applied to the feet, and then the blankets are folded under. The patient may remain in the pack from twenty minutes to an hour or more. Figs. 110, 111, 112.

The hot blanket pack is one of the best heating measures available, and is suitable for rheumatic affections, uræmic poisoning, influenza, collapse, shock, acute Bright's disease, convulsions (especially in children), cholera morbus, peritonitis, pneumonia, and typhoid fever.

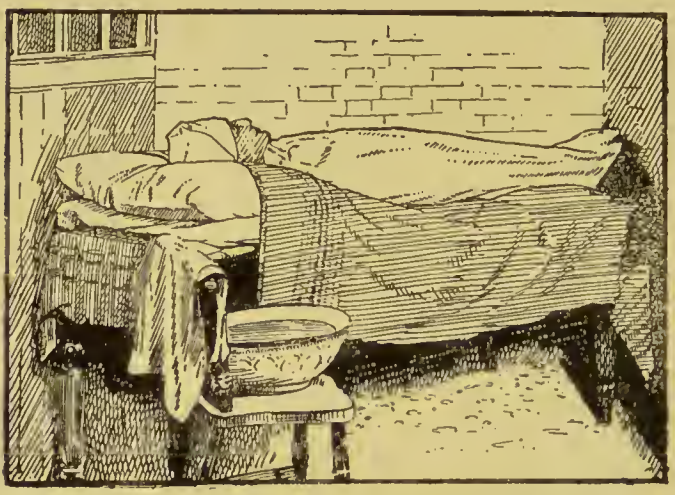


Fig. 113. Wet Sheet Pack. 1st Step. Patient Wrapped Snugly in the Moist Sheet.

The Wet Sheet Pack.

A pair of sheets, four blankets, towels, and water at a temperature of 50° to 70° are required. For tonic effects, the patient is allowed to remain in the pack for fifteen or twenty minutes, or until he feels a glow of warmth; for eliminative effects, one to two hours are required.

The procedure is the same as for the blanket pack except that a sheet is used, which is wrung out of *cold* water. The sheet should be wrung fairly dry. A hot bottle is applied to the feet. Figs. 113, 114.

The tonic wet sheet pack is a means of reducing the temperature in cases of fever. It is also a strengthening treatment for wasting diseases, general debility, anæmia, consumption, chlorosis, and inactivity of the liver.

When prolonged, it is recommended for chronic bronchitis and pleurisy, constipation, and gastric and intestinal catarrh. But this treatment is not suitable for feeble patients, and should not be given where there is an eruption of the skin.

The Cooling Pack.

A wet, dripping sheet, which has been soaked in water at a temperature of 60° to 75° Fahr., is wrapped about



Fig. 114. Wet Sheet Pack. 2nd Step. Blankets in Position.

the patient, and one or two blankets, adjusted so as not to prevent evaporation. Another dripping sheet is substituted as soon as the first is warm. This is a powerful means of reducing temperature, and should always be used with skill and care.

The Dry Pack.

The patient is wrapped snugly in several blankets, surrounded by hot water bottles, and given hot water to drink. Very soon free perspiration sets in. The dry pack is a good treatment for shock, collapse, obesity, chronic

rheumatic disorders, and neuralgia, and is often more convenient to give than the moist pack. It should be avoided where there is great weakness of the heart or a skin eruption.

The Half-Pack.

Any of the above packs may be given to half the body, to the trunk, or to one or more of the limbs for local effects. The procedure is so simple that no further directions are required.



Fig. 115. Wet Hand Rub.

The Dry Abdominal Bandage.

This is a dry pack, consisting of two or three thicknesses of dry flannel, wrapped snugly about the abdomen. It may be ten to fifteen inches in width. The bandage serves for both support and warmth, and relieves indigestion, biliousness, and irregularities of the bowels.

TONIC MEASURES.

Tepid or Cold Wet Hand Rub.

This makes one of the mildest of tonic remedies if tepid water is used. The water should be from 40° to 80° Fahr. Even iced water may be used. Have several Turkish towels to hand. Place the patient on a couch, wrapped in a sheet and blanket. Expose each part of the

body as required. Begin with the chest, which is quickly bathed with the hands, care being used not to spatter water in the patient's face. Then dry quickly, leaving a red glow of warmth. Cover the chest and proceed to the abdomen, right and left arms, right and left legs, and finally the back. The treatment must be given briskly to accomplish the most good, and each part should only occupy a few seconds. Fig. 115.

The tepid or cold wet hand rub is a first class method of reducing temperature and increasing vital resistance. It is especially adapted to children and the aged because of its exceedingly mild nature.

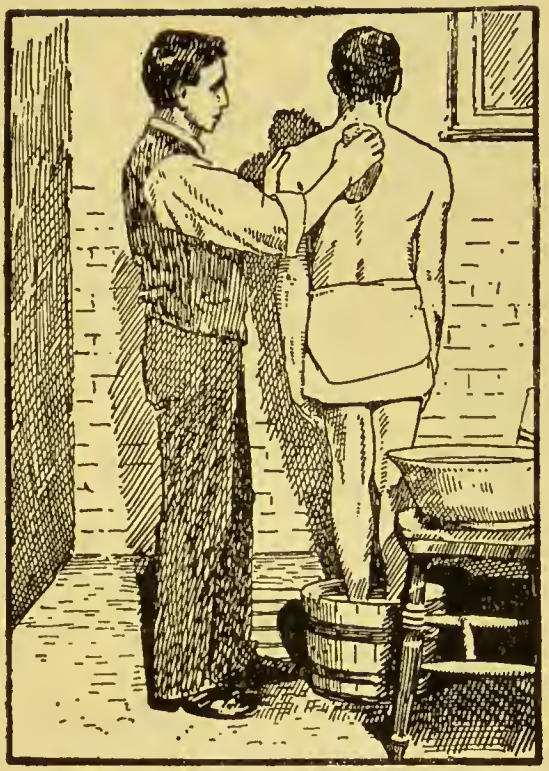


Fig. 116. Tepid or Cold Sponge Bath.

The Cold Sponge. (50° to 70° Fahr.)

Have the patient standing in hot water (105°) and, by means of a sponge or small Turkish towel, go over the body rapidly, then wrap in a dry sheet, and rub vigorously. Bathe the face with cold water on leaving the foot tub. The cold sponge may be taken by the patient without assistance, or given by an attendant. See Fig. 116.

Although a mild tonic, it is more vigorous than the

wet hand rub. It is a valuable measure in anæmia, chlorosis, nervous debility, general malnutrition, and dropsy.

A cool or cold sponge is a most effective means of treating fevers, especially in children, the aged, and feeble patients.



Fig. 117. Wet Towel Rub.

The Tepid Sponge.
(80° to 90° Fahr.)

This is a still milder tonic, and very useful for relieving light fevers. Given gently, it is an excellent means of refreshing anyone who is tired or worn out. Fig. 116.

The Hot Sponge.
(120° to 140° Fahr.)

The sponge should not be moist enough to drop water, and the treatment should be administered quickly. The patient may be lying on a couch or standing, as desired. It is recommended for relieving night sweats. If vinegar or alcohol in equal parts be added, the results are still more satisfactory.

The Tepid or Cold Towel Rub. (50° to 90° Fahr.)

The higher temperatures are for feeble patients. First bathe the face and neck with cold water, and then apply a cold compress to the head.

The patient may lie or stand, as circumstances demand. Wring a linen towel rather dry from the cold water and lay it on the chest, then rub the towel briskly, not the skin. Much of the success of this treatment depends on the rapidity and vigour of the friction. The skin should be left in a healthy glow. Fig. 117.

This is a stronger tonic than the cold sponge, and is not always suitable for weak and infirm patients, especially if they do not react readily.



Fig. 118. Giving the Salt Glow.

The Salt Glow.

Soak some common salt in water for a few moments and rub the moist salt upon the surface of the body. The patient may lie on a marble slab, or stand in a foot tub of hot water. Begin with the right arm, then the left arm, the chest (gently), the abdomen, back, and finally the legs and feet. Fig. 118.

The attendant must take pains not to be rough and cause an abrasion of the skin. A tender, sensitive skin is easily injured unless proper precautions are taken. It should be remembered that blonde persons are usually the most sensitive.

The salt glow is followed by a spray, shower, or dip

in cool or cold water, or a pail-pour, to get rid of the salt, and then the patient is dried.

This is one of the best tonic measures. It leaves the skin in a healthy, active condition. It is very useful for strengthening the skin, and increasing the general vital resistance.



Fig. 119. The Mitten Friction.

The Cold Mitten Friction.

(32° to 50°.)

Cold or ice-cold water may be used, according to the case and the effects desired.

A well-fitting mitten made of Russell cord, coarse mohair, or some other rough cloth, is wetted in cold water and rubbed briskly over the skin. Vigorous friction is desirable in order to produce the best results. The patient lies down on a couch and is covered with a sheet or a blanket, each part of the body being exposed as required, and then covered again. The face and head are first bathed with cold water, after which the attendant begins with the right arm, and proceeds over the body in the usual order. Fig. 119.

The strength of the tonic depends on the temperature of the water and the amount of moisture in the mitten, also the amount of friction employed.

Hysteria, neurasthenia, anæmia, chlorosis, consump-

tion, diabetes, rickets, dyspepsia, scurvy, paralysis agitans, and other chronic wasting diseases are benefited by the cold mitten friction. It is a good general preventitive against colds and influenza.

The Oil Rub.

This delightful and conservative measure is generally useful in almost all conditions of health and disease. Olive oil, cocoanut butter, or some other lubricant may be used. But little oil is required, and this should be rubbed well into the skin. Any surplus oil may be removed by a towel.

Moderate friction should be used, this being at once a mild tonic, and to a certain extent, a sedative. It is a fallacy to think that the body is nourished to any considerable extent as a result of the inunction. Under the most favourable conditions, only the merest trace of oil enters the circulation.

The oil rub is a good finishing treatment after a warm bath and a salt glow, or following cold mitten friction. But it may be given to advantage under almost any conditions, and forms by itself a good mild tonic.

It is useful in chronic dyspepsia, diabetes, malnutrition, anæmia, chlorosis, and a number of other disorders.

THE INTERNAL USE OF WATER.

Next to oxygen, water is the most indispensable of the bodily requirements, and life would cease to exist sooner if deprived of water than of food. The living cells of the body are literally bathed in water continually. "Water-drinking is an internal bath; it dilutes the fluids of the body in which the cells and fibres are bathed; it purifies the body by diluting the medium in which it lives. By

the free use of water, the movement of the mass of liquid in which the living elements of the human body perform their work is quickened, and the stream of life runs clear and pure."*

Physiological Effects of Water-Drinking.

Water taken internally exerts a direct stimulating effect upon the kidneys, the glands of the skin, and, indeed, upon all the excretory organs. It encourages both the constructive and the disintegrative processes of the tissues, serving as the medium for carrying food material to, and removing waste from, the tissues.

Cold Water Drinking.

Under ordinary conditions, cold water, that is water at a temperature of from 60° to 70° Fahr., is the proper drink, and may be considered as a true tonic. Very cold water is often helpful in fevers and certain other conditions, but it should be taken slowly and in small quantities.

Free water-drinking is desirable for all persons, but it is especially valuable in various pathological conditions, particularly in all rheumatic and gouty disorders. Obesity, diabetes, gall-stone colic, chronic indigestion, biliousness, constipation, alcoholism, among other more or less chronic disorders, are all greatly benefited by the free use of water.

A pint of cold water at night and another an hour before breakfast, make one of the most effectual remedies for chronic constipation. Free water-drinking is also a successful measure in combating colds.

For fevers, a patient may have all the water he wants.

*Dr. J. H. Kellogg, in "Rational Hydrotherapy."

Dr. Kellogg recommends a glass each hour. It is a great aid in the elimination of poisonous wastes from the body.

Avoid cold water, except in small quantities, when wearied or sweating vigorously.

Hot Water Drinking.

It is remarkable to note the very high temperature at which water and other fluids are often taken. Extremely hot drinks cannot fail to be injurious if taken habitually. Even hot water (120° to 140° Fahr.) soon has a debilitating effect upon the body, and it is not wise to persist in its daily use, unless prescribed by a physician. Acidity of the stomach can usually be relieved by drinking a glass of hot water. Gastralgia, or stomach-ache, is also relieved by the same measure.

Lukewarm water, taken very freely, makes a simple and very efficient emetic. One or two pints are necessary as a rule. The addition of a little mustard makes the emetic still more effectual.

How Much to Drink.

There are two extremes. Most people do not drink enough, some scarcely taking water at all. A few others might be considered disciples of Priessnitz, who frequently recommended ten, fifteen, or even twenty pints per diem. Of course this is altogether too much, and can scarcely fail to do damage. We would recommend from two to five pints per day, according to the nature of the diet, climate, and other circumstances.

When to Drink.

The question, when one ought to drink, is briefly answered by replying, any time except at the meals. Persons suffering from indigestion ought to wait one or

two hours after meals before taking any considerable quantity of water.

The objections to drinking at meals are as follows :—

1. It interferes with thorough mastication of the food.
2. It dilutes the saliva and gastric juice.
3. It destroys the delicate flavours of food.
4. It retards both salivary and peptic digestion.

Mineral Waters.

The value of water-drinking is inherent in the water itself, and not in the salts or other things it may contain. It has been well said that "mineral waters are simply diluted drugs," and this is absolutely true. The best water is the purest. There is, however, no objection to aërated distilled water, which is absorbed into the system sooner than plain water.

Hard water should be boiled, and the longer it is boiled, the purer it becomes. Boiling precipitates some of the salts. Those living in chalky districts would do well to use distilled water, which is easily prepared by a simple family still, to be had at small cost. Such temperance drinks as home-made lemonade, orangeade, and grape, cherry, raisin, strawberry, and other juices diluted with water are both wholesome and refreshing.

The Enema or Water Injection.

The enema consists of an injection of plain water or of specially prepared fluids into the rectum and colon by means of a bulb or fountain syringe. The quantity varies with the object sought, but usually amounts to from one to four pints. A larger quantity is likely to produce permanent dilatation of a flaccid and weakened colon, and the use of three or four quarts, or even more, at one time, is a reprehensible practice.

Among the more common varieties of enemata are the following :—

Plain hot or cold enemata.
Soap enemata.
Starch enemata.
Tannic acid enemata.
Graduated enemata.
Nutrient enemata.

In giving an enema, have the patient lie on the left side, or on the back with hips elevated. To get the fluid into the deeper recesses of the colon, put the patient in the knee-chest position, that is, resting on his knees and chest.

The Plain Enema.

The best all-round temperature is 80° Fahr., and at this temperature the water has a tonic effect upon the bowels. If warm, the effect is relaxing.

A cold enema is useful in reducing fevers. The temperature is 60° to 70° Fahr. Only a small enema must be given if it is to be retained, say a half to a full pint.

The cold enema has marked tonic effects upon the colon, and stimulates peristalsis.

Soap, Starch, and Acid Enemata.

Soap-suds, made from a good grade of soap, will more quickly and thoroughly relieve the bowels than plain water. The temperature should be 70° or 80°.

The starch enema is very soothing, and is helpful in relieving diarrhœa. It is prepared by making a very thin paste of starch and water. Usually only one or two pints are injected.

A teaspoonful of tannic acid to one pint of water is the proportion ordinarily used for an acid enema. Other acids and antiseptics are occasionally employed.

Graduated and Nutrient Enemata.

For those who have acquired the enema habit, the graduated enema affords a simple means of getting rid of it. Begin with three pints at 90° Fahr., and reduce the quantity one quarter of a pint and two degrees daily. In chronic cases, it is often necessary to repeat the treatment, and even then it fails at times.

Nutrient enemata, as the name indicates, contain nourishment and are very useful for feeding patients who are unable to take food by the stomach. A well-beaten, raw egg in plain or peptonised milk makes a very good combination. Before injecting the nutrient it is necessary to wash out the bowel by giving a full plain water enema. Such enemata should be given under the direction of the family physician.

Irrigation of the Nose and Ear.

It is sometimes desirable to cleanse the nostrils, and this can easily be done by running in warm or hot water containing one teaspoonful of salt to each pint of water. A syringe is not really necessary, for, on closing one nostril with the finger, the water is readily drawn up the other. Irrigation of the nose in this way is most helpful in both acute and chronic nasal catarrh. Draw the head forward while syringing or inhaling the water.

The greatest care must be used in syringing the ear, and force must not be resorted to by the amateur. Where there is a discharge from the ear, the drum is not infrequently perforated, and if force were used, the water might be driven into the middle ear, and much damage result. In all cases of ear disease, it is necessary to seek the advice of a physician.

Sometimes ear-wax accumulates in a healthy ear,

causing ringing, singing, and other unpleasant noises in the head. The wax can readily be removed by dropping sweet oil or a saturated solution of common baking soda into the external canal of the affected ear, and, after it has dissolved the wax, syringing with warm water. The operation can be repeated if necessary.

CHAPTER XXIV.

Poisons and Their Antidotes.

THAT prevention is better than cure applies with peculiar force to poisoning. The greatest pains should be taken to keep all poisonous drugs and matter out of the reach of children, and where they cannot possibly be mistaken by anyone. It is a good practice to have a high shelf in a closet, or a cupboard that can be locked, reserved for poisonous substances. Poisons should always be kept in plainly labelled bottles, so shaped that they can be distinguished readily in the dark or when in a hurry.

These simple precautions would be the means of saving many lives each year.

What to Do in Emergencies.

As soon as it is discovered that anyone has taken poison, accidentally or otherwise, *send at once for a physician*, telling him the nature of the poison if possible.

If the poisonous substance or fluid taken is not obvious, and the knowledge cannot readily be obtained, endeavour at once to produce vomiting. For this purpose give a large quantity of lukewarm water, and tickle the throat with the finger or a feather. A teaspoonful of ground mustard added to each glass of lukewarm water makes it still more effective. In other cases the same amount of salt in water is useful. After free vomiting, repeat the

process, so as to remove as much of the poison as possible. Afterward, give some bland fluid, such as milk, gruel, flour and water, oil, or several well-beaten raw eggs.

If there is marked depression, administer hot water or hot milk to drink, and apply hot water bottles to the limbs and trunk, covering well with warm blankets.

It is not necessary to be nice about the water or other emetic given. *Rapid treatment* is the keynote to success. A delay of only a few minutes may cause fatal results. As soon as the physician arrives, he will take charge of the case, and the brief directions here given only apply to the interval which elapses while waiting for medical help.

Decayed Food.

Flesh foods are most likely to give trouble, and they also cause the most severe forms of poisoning. It is of the utmost importance that no decayed food of any kind should be taken; for it is always dangerous, and sometimes produces fatal results. The proper treatment is to excite vomiting as soon as possible, and then administer a good dose of castor oil. Powdered charcoal is also valuable.

Alcoholic Poisoning.

Set up vomiting, and so get rid of as much of the poison as possible. Apply heat to the patient, and give hot water to sip.

Opium and Its Family.

This includes morphine, laudanum, paregoric, and black drop. Most of the quack nostrum pain-killers, and soothing syrups contain opium in one form or another, and are decidedly harmful. Give an emetic at once, using lukewarm water for this purpose. See that the stomach is well washed out.

Watch the respiration closely, for this is the critical matter. As long as the breathing rate is above ten per minute, there is no immediate danger. The faradic battery is useful to quicken respiration. As soon as the breathing drops below ten per minute, resort to artificial breathing, which is described on pages 386, 387.

Strychnine and Nux Vomica.

Provoke vomiting, and also give magnesia or Epsom salts to purge the bowels. Bromide of potash is recommended, but should be given by a physician. Put the patient to bed in a quiet, darkened, but well-ventilated room, and see that he is not disturbed.

Aconite.

Induce vomiting, and wash out the stomach. Then give hot water or hot milk, and apply warmth to the body. Fomentations to the spine, and the application of hot water bottles, are useful measures.

Arsenical Poisoning.

Arsenic is the essential ingredient in many powders and poisons for household pests. It may also occur in cheap paints and wallpapers. Milk should be given very freely, or flour and water, eggs, or oil. Dialysed iron, followed by a glass of hot, salt water, is the antidote, after taking which further vomiting should be brought about.

Phosphorus.

Match-heads contain phosphorus, and the same is true of many vermin poisons. Since the poison is but slowly absorbed, the case can be treated by medical aid. Small doses of copper sulphate in water may be given, and vomiting induced. Do not give oil.

Sugar of Lead.

Induce vomiting, and give oil, milk, or eggs.

Lunar Caustic or Silver Nitrate.

Lunar caustic leaves a brownish-black, characteristic stain wherever it has come in contact with the skin. Give strong brine in frequently repeated doses, and provoke vomiting. A bland fluid, such as olive oil, may be given after the vomiting.

Corrosive Sublimate or Bichloride of Mercury.

This is a common antiseptic in hospitals and surgical wards. It is in the form of colourless crystals or dissolved in clear water. If at hand, give tannic acid in water, and produce vomiting. A strong cup of tea is an excellent antidote. Then follow by milk, beaten eggs, or a solution of flour and water.

Prussic Acid.

A small dose of prussic acid is capable of causing almost instantaneous death, for the poison is exceedingly virulent. Produce immediate vomiting, if possible, by giving warm water and tickling the throat. Then follow with soothing fluids, for example, milk, raw beaten eggs, or oil.

Carbolic Acid.

This is another deadly poison. Vomiting should be induced, if possible, by administering emetics, such as lukewarm water. A tablespoonful of Epsom salts dissolved in water may be taken to advantage. Then give olive oil, nut oil, cod liver oil, milk, or white of an egg.

Oxalic Acid.

Give lime water at once, or chalk, tooth powder, or whitewash. The plaster may be taken from a wall,

crushed, and administered in water. Follow by bland liquids, such as milk, oil, or well-beaten egg.

Mineral Acids.

The more common mineral poisons are sulphuric, nitric, and hydrochloric or muriatic acids. The first-named is known as oil of vitriol, and the latter, spirits of salt. These mineral acids are among the most deadly of poisons, and they act very quickly. They produce terrible burns of the lips, mouth, and œsophagus, and if more than the minutest quantity is taken, the results are likely to be exceedingly grave, for the acid very soon eats its way through the wall of the stomach, causing perforation and rapid death.

Do not encourage vomiting, for it is useless. Give alkalies at once, such as baking or washing soda, common soap, chalk, tooth powder, or plaster mixed in water, to neutralise the burning acid. Give the first available antidote that comes to hand so as to avoid delay, if possible.

Alkaline Poisons.

The natural antidote is an acid, and we have in vinegar or lemon juice the best means of relief. Either should be given undiluted. The alkalies burn or destroy the mucous membrane. It is better not to encourage vomiting. Follow with oil or gruels, and put the patient to rest.

The following brief summary of the different treatments is taken from Dr. Dulles' excellent book on "Accidents and Emergencies":

Poison.	*Treatment.*
Unknown.	Emetic. Bland liquids. Stimulation.

Acids. Sulphuric. Nitric. Muriatic.	An alkali. Bland liquids. Rest. Stimulation.
Oxalic acid.	Emetic. Chalk. Bland liquids.
Carbolic acid. Creosote.	Emetic. Epsom salts. Bland liquids. Rest. Stimulation.
Prussic acid. Oil of almonds. Cyanide of potash.	Emetic. Bland liquids. Stimulation.
Alkalies. Hartshorn. Soda. Potash. Lye.	An acid (vinegar). Bland liquids. Rest. Stimulation.
Arsenic. Paris Green. Fowler's Solution.	Emetic. Dialysed iron and salt. Castor oil. Rest. Stimulation.
Sugar of lead.	Emetic. Epsom salts. Bland liquids. Castor oil.
Corrosive sublimate. Tartar emetic.	Emetic. Strong tea. Raw eggs and milk. Castor oil. Stimulation.
Phosphorus.	Emetic. Sulphate of copper. Turpentine. Magnesia.

Croton oil.	Emetic. Bland liquids. Laudanum or paregoric.
Lunar caustic. (Nitrate of silver).	Salt and water. Castor oil. Bland liquids. Emetic.
Iodine.	Emetic. Cornflour and water. Bland liquids.
Opium. Morphine. Laudanum. Paregoric, etc. Chloral.	Emetic. Strong coffee. Keep up breathing.
Belladonna. Atropia.	Emetic. Warmth. Coffee.
Strychnine.	Emetic. Purgative. Absolute quiet.
Aconite. Veratrum viride.	Emetic. Stimulation. Head low.
Hemlock. Nightshade. Toadstools. Tobacco, etc.	Emetic. Stimulation.
Alcohol.	Emetic. Hartshorn and water.
Decayed meat and vegetables.	Emetic. Purgative. Powdered charcoal.

CHAPTER XXV.

Accidents and Emergencies.

IN all accidents and emergencies it is essential for someone to maintain presence of mind, and act calmly, quietly, and intelligently. To expect more than one or two to keep cool and use good judgment, is asking too much. Let the others take care not to act as hindrances.

Ceneral Directions.

First, send for the nearest doctor, explaining the situation as fully as circumstances permit, either by a brief note or by a full verbal message. Also send for a stretcher, or improvise one, if necessary.

If there is a crowd, persuade the people to draw back and give opportunity for suitable assistance. Emotional outbreaks should be controlled as far as possible. Remove any weight or débris resting on the patient as gently as you can, and get him into a comfortable reclining position, with head raised.

Now loosen the clothing tenderly, and apply hot or cold applications as indicated. Keep the body warm.

If the patient has ceased breathing, but the body is still warm, apply artificial respiration as directed for drowning (page 386), and do everything possible to resuscitate life. Control bleeding by pressure or other means.

The Use of Stimulants.

Do not give whisky, brandy, port wine, or any form of alcohol. This is one of the most common mistakes of

well-meaning people. The partial or total intoxication resulting is far more likely to do harm than good. Further, it will mask the symptoms, and is thus liable to deceive the physician in his diagnosis. Such stimulants, again, are likely to interfere with the proper treatment.

We must remember that alcohol is more of a narcotic (that is, a depressant) than a stimulant; and that the depression, which is sure to follow its use, is dangerous.

It is far safer and better to give plain hot water or milk, and leave the use of alcohol to the physician.

To Improvise a Stretcher.

A wide, strong board, or a couple of boards well fastened together and six or seven feet long, will do in an emergency. Or a door, shutter, or window-blind may be utilised. Any of these should be covered with a folded blanket or two. A light couch or settee may also serve the purpose if nothing better is available. In carrying the patient, march out of step to lessen jarring, and have the head first going up, and feet first coming down a hill or stair.

The medical chest of each home should contain a roll of absorbent cotton and half a dozen bandages of different sizes, from one inch to four or five inches wide and one to twelve yards long.

Hæmorrhage.

An accident leading to bleeding always causes alarm and requires a person of steady nerves to deal with it intelligently. The bleeding may be internal or external. A careful study of the heart and the circulation of the blood, described in the chapter on physiology, will be very helpful in dealing with such an emergency. *In all cases of severe hæmorrhage from any cause, send for the physi-*

cian as soon as possible. Delay is dangerous, and may be fatal to the patient.

Arterial Hæmorrhage.

This kind of hæmorrhage is the most likely to be fatal. The blood comes in spurts, and is of a scarlet colour. If a large vessel, push your finger or thumb into the wound to stop the bleeding. Apply a ligature (tight bandage) between the heart and the wound. A strong handkerchief will serve the purpose, and it may be made tight by tying a knot into which a small stick is slipped and then twisted sufficiently to stop the bleeding, but no more. If a piece of cork is placed over the bleeding vessel, as shown in Fig. 120, the device is still more effectual.

Venous and Capillary Hæmorrhage.

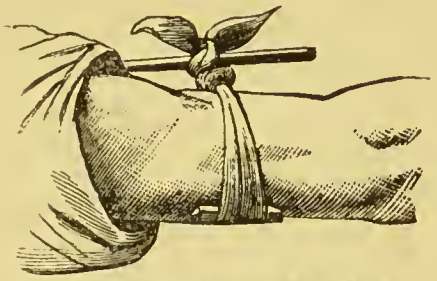


Fig. 120. Compression of Main Artery of Arm by Cork and Handkerchief.

Hæmorrhages from the veins or capillaries are comparatively innocent. In the former there is a slow, steady flow of dark blood; in the latter an oozing of red blood. The application of a cold compress is often sufficient to stop such bleeding. A pad and pressure by means of a bandage may be used if required.

Hæmorrhage from the Nose.

Probably nose-bleed is sometimes a natural means of reducing the amount of blood in the body. To control it, apply cold to the nape of the neck, or, better still, an ice-cold compress around the neck. Throwing the head as far back as possible, while standing or sitting, is often an efficient remedy.

Hæmorrhage in the Mouth.

This may be stopped by means of a suitable pad or plug of absorbent cotton, and firm pressure.

Pulmonary Hæmorrhage.

Bleeding from the lungs is distinguished by frothy, red blood which is brought up by coughing. Rest in bed in a semi-recumbent position, and the swallowing of ice pellets, is the proper treatment. A hot leg pack is an excellent procedure to adopt. The ice-cold compress to the chest is also recommended.

Hæmorrhage from the Stomach.

The blood is of a dark, ground coffee colour, and is brought up by vomiting. Give ice water or broken ice internally, and a cold or ice compress to the stomach. There must be absolute rest in bed, and no food must be taken by the mouth, except under the direction of the physician.

The Treatment of Wounds.

There are many kinds of wounds, but we can only mention briefly a few of the most common varieties. It is a safe rule to send immediately for the nearest medical man, so as to get skilled attention at the earliest possible moment. The after results and final outcome often depend almost as largely upon the kind of treatment received in the earliest stages as upon the injury itself. To cleanse an open wound, soak a clean sponge or piece of absorbent cotton in boiled or distilled water, and compress it above the injury, so that a stream of water will fall on the wound. There is little danger of doing harm if this simple direction is carefully followed.

Bruises.

A severe bruise is often very painful, and results in more or less discolouration—for example, a "black eye." The treatment is rest and the application of either hot or cold compresses, according to the conditions. Later, massage would be useful in dispersing the stagnant blood which has infiltrated the tissues and is the cause of the discolouration.

Internal Contusions.

If there are indications of internal injury, send for the physician, putting the patient to bed and keeping him warm. There would be no objection, as a rule, to the use of fomentations in the meantime, and the heat would often allay the pain.

Clean-Cut Wounds.

These should be carefully cleansed, and the edges brought together by adhesive plaster, after which a plain dressing of cotton wool and a bandage are all that one requires. If it is necessary to sew up a wound, it should be done by a physician if possible. The accompanying cut illustrates the difference between a granny knot, which should not be used, and a reef knot, which is the proper thing. Fig. 121



Fig. 121. Reef Knot. Granny Knot.

If a small piece of the nose, ear, finger, or toe be cut off, wash it in warm water, and replace, keeping it warm, till the arrival of the physician. Not infrequently union will take place, and a deformity will thus be avoided.

Pin and Needle Wounds.

These are usually insignificant. Still it is worth while to wash the wound in hot water and squeeze out

some blood, so as to remove any dirt or germs that may have entered with the instrument.

Wounds of the Hands or Feet.

Wounds from rusty or dirty nails, tacks, etc., should receive a thorough cleansing with hot water. It is often well to enlarge the wound by the use of a sharp, clean knife, and then press out some blood. Dress with a moist compress and bandage.

A Fish-Hook.

If possible, it is usually best to cut away the cord and the broad end, and then pass the hook on through the flesh as in sewing. Then bathe in hot water and cleanse well. Severe throbbing pain with swelling would indicate infection, in which case it might be necessary to open the wound by lancing. This should be attended to by a physician.

Splinters.

Remove with a sharp, clean knife, if necessary, and soak the wound in hot water. It is often better to call a physician, and by so doing much suffering and inconvenience may often be avoided.

Gunshot Wounds.

These wounds always require the attention of a surgeon. While awaiting his arrival, put the patient to bed, applying hot bottles if there is depression. Cold wet cloths may be applied to the wound.

Crushing of the Hands, Feet, etc.

Wrap the crushed limb in a warm dressing, and support with a suitable splint. Use cold applications if there is much bleeding. Put the patient in the recum-

bent position, and apply hot bottles and warm clothing. Hot water or milk may be given internally to revive the injured person.

Broken Bones.

A fracture requires medical skill, and the amateur can render only temporary assistance.

Pain, deformity, unnatural mobility, and a peculiar grating are the characteristic signs of fracture. There are two classes: *simple*, where the skin remains intact, and *compound*, when there is a communication between the wound and the air. The latter are naturally more difficult to deal with, and more dangerous to life, because of the chance for infection through the broken skin.

After sending for the surgeon, get the patient in as comfortable a position as possible without aggravating the injury, and keep him warm and free from excitement.

Sprains.

It is a mistake to neglect sprains, and the consequence may lead to very unpleasant results. Apply moist heat, a dressing, and give *absolute rest* for several days. The last mentioned is the most important treatment.

Dislocations.

A dislocation is a displacement of the joint ends of bones, and requires surgical treatment. There is always more or less tearing of the ligaments and other tissue about the joints as well as deformity and pain. Moist heat is very useful in most cases. Surgical assistance should be called promptly.

Burns and Scalds.

A burn is serious or dangerous according to the extent of the skin area involved, as well as the depth. If it covers half the body, the result is likely to be fatal.

If the clothes catch fire, do not run about or out into the street, but lie down at once and wrap yourself in a blanket, carpet, or shawl, and thus stifle the flames. If a child's clothing takes fire, roll it in a blanket, cloak, or rug. Woollen clothing, being slowly inflammable, is best for this purpose.

Cut away the clothing so as to disturb and injure the body as little as possible.

Large blisters may be opened at the edge by a clean, sharp needle, and drained.

The burnt skin may be dressed with pure olive oil, sweet oil, castor oil, or soft vaseline, which may be applied on pieces of clean old linen or muslin. The object is to afford protection from the air, and also render examination of the wounds easy.

The continuous neutral bath (92° to 97° Fahr.) is often useful for extensive burns.

Remember that fatal cases are sometimes the least painful.

Treatment of Mild Burns.

Slight burns may be treated by cold water alone, or by the application of moist strips of muslin or linen soaked in a solution of baking soda (a tablespoonful to a half pint of water). Carron oil (equal parts of linseed oil and lime water), the white of an egg, or vaseline may be used. There is great relief as soon as the air is effectually excluded. Prevent all friction of the injured skin. Avoid using as a dressing anything that is likely to come off with difficulty.

The Bites of Serpents.

If the serpent is known to be poisonous, suck the wound. Apply a tight bandage between the wound and the heart, if possible; otherwise, use firm compression on

the side nearest the heart. Some recommend cutting out the bitten flesh or searing it with a red-hot knife blade or other convenient instrument. Then soak in hot water and press out some blood if possible.

Don't give whisky to cause drunkenness, as some recommend. Further poisoning of the system does not improve the case. It is better to apply the whisky or brandy locally as an antiseptic.

The Bites and Scratches of Cats and Dogs.

These are sometimes followed by severe inflammations. Suck the wounds if accessible. Then cleanse well in hot water, pressing out blood to remove the infection.

Genuine hydrophobia is exceedingly rare, and there are medical men who seriously doubt its existence. If the dog is healthy there is nothing to fear from a bite, provided the wound is properly cleansed. The bite of a sick dog may lead to some inflammation, which is severe at times. After sucking the wound, apply hartshorn or some other antiseptic, and cleanse well in hot water.

It is a mistake to kill the dog. Keep it under observation for a time. If it gets on all right, there is no need for the patient to worry.

Foreign Body in the Throat.

This is most common in children. It is caused by the presence of a foreign body, such as a marble, button, or coin in the gullet or windpipe. Coughing would indicate that it is lodged in the windpipe. If it is in the gullet, the patient will be unable to swallow. In this case vomiting will sometimes expel the object. If a child, hold it by the legs, head downward, to give gravity a chance to act, and also strike smartly on the back near the neck.

If it is a pin, needle, or fish-bone, the taking of plain, rather bulky food, such as coarse bread, porridge, potatoes, and other vegetables, may enable the object to pass through the alimentary canal without serious consequences.

It is well to send for medical help, unless the object is quickly dislodged and removed. Do not use instruments, lest greater harm result.

The Loss of Consciousness.

This is due to a variety of causes, and calls for the help of a competent physician in many cases. Insensibility may result from disease or injury of the brain, poisoning, or alcoholic intoxication.

The treatment consists of rest, quiet, and the application of warmth.

Fainting.

This is due to a temporary weakness of the heart. There is great muscular weakness, and the patient falls if not supported. Get him into the recumbent position with the feet elevated or the head lower than the body. Loosen collars, stays, and bands. Throw water on the face if consciousness does not return rapidly, or apply smelling salts. Afterward give the patient complete rest and quiet for a time.

Concussion of the Brain.

This is popularly called stunning, and is due to a fall or blow on the skull. There is often sickness and fainting, also depression and marked pallor. The mind is confused.

To treat, put the patient to bed in a quiet, well-ventilated room, and apply heat if required, summoning medical aid as soon as possible.

Foreign Bodies in the Eye.

Cinders, soot, dust, metallic particles, grit, or small insects may get into one or both eyes, and cause great trouble. Never *rub* the *injured* eye. In minor cases, rubbing the *uninjured* eye vigorously, while holding the other open as wide as possible, may soon bring relief. The rubbing causes a free flow of tears in the afflicted eye through sympathetic action, and this may be sufficient to wash away the offending particles, and thus bring relief.

The lower lid is easily examined by pressing it down while the patient looks up.

The upper lid may be turned out by drawing the lid up over a knitting-needle. Remove the foreign body by a corner of the handkerchief. Never use an instrument for this purpose, for there is great danger of further and more serious injury.

The eye may then be bathed in warm or tepid water, and bandaged for a time, if necessary.

Lime in the Eye.

Wash the eye freely with lemon water (one teaspoonful to a glass of water).

Foreign Bodies in the Ear.

Children sometimes ignorantly put peas, beans, or other small objects into their ears. Insects, too, may gain entrance to the external ear. If an insect, put in olive or sweet oil, and then syringe with warm water. If a pea or bean, avoid using water, for it will cause such a body to swell and make it more difficult to remove.

The use of instruments should be avoided by the untrained, because of the damage that may be done.

There is no great hurry in these cases, and it is best to wait for the physician to deal with the obstruction.

Foreign Bodies in the Nose.

Children, again, are liable in their play to introduce various articles into the nose. Vigorous blowing of the nose, or sneezing, will often dislodge the foreign body. Do not use instruments to fish out the obstruction, but get the aid of a physician as soon as possible if the obstruction is not readily moved.

Drowning.

Death is usually due to arrest of respiration by the fluid. Two minutes under the water is sufficient to cause death in many cases. Others, again, have been resuscitated after submersion for five minutes, or even longer. Always give the patient the benefit of the doubt, and give him a chance for life, no matter how slim that chance may be.

After sending for a doctor, free the mouth of water and other matter that may be present, and draw the tongue forward. Then place the patient on his face, with a towel or cloth under the head so that it will not be injured, and placing the hands under the lower chest, raise the body and compress the chest, so as to let the water run out of the lungs. Fig. 122.

Then turn the patient on his back, placing a folded coat or shawl under his shoulders, and give artificial respiration.

Grasp the arms below the elbow, and bring them up over the head backward, giving a steady pull for two or three seconds, then return them to the sides of the chest, pressing in to expel the air. Figs. 123 and 124. Repeat



FIGS. 122, 123, AND 124 (NUMBERING FROM ABOVE)
ARTIFICIAL RESPIRATION.

the movement steadily and evenly about fourteen or fifteen times each minute, until natural breathing returns or all hope of life is gone. Cases are on record of resuscitation being effected only after several hours' faithful effort.

It is well to have one or two attendants rub the patient to restore animal heat and stimulate the skin. As soon as breathing is well established, hot drinks may be given. The patient should be watched for several hours, until all danger is past.

Strangulation.

This may result from hanging, or any severe form of constriction of the neck by which the windpipe is closed. Administer artificial respiration as directed for drowning, after removing the obstruction.

Suffocation.

This is usually due to breathing poisonous gases, such as carbonic acid gas, illuminating gas, and the foul fumes of mines, deep wells, and cisterns. The fumes of burning charcoal are also very poisonous.

Use artificial respiration if necessary, and provide fresh air, rest, and warmth.

Sunstroke

Heat-stroke is really the proper name for this affection, and not sunstroke, long exposure to great heat being the cause. This leads to a rise of the bodily temperature, causing severe headache and a feeling of oppression. The skin is hot and dry, and there is every evidence of a high fever. These symptoms, when they first appear, should be regarded as a warning; and preventive measures should be adopted promptly.

The treatment consists of a cooling bath or cold sheet pack to lower the temperature and revive the patient. Bathe the head with cold water, and apply a cold compress. The cold treatment may be discontinued when consciousness returns. Give rest in a cool, quiet, well-aired room. The services of a physician should be secured as soon as possible.

Heat Exhaustion.

This is manifested by marked depression and general weakness. The skin is usually cold and wet. Treat by removing the patient to a cool, airy room, and give absolute rest.

Lightning Stroke.

As would be expected, there is a great nervous shock. The pulse is very weak, and breathing is slow and often laborious. Give rest and warmth.

SIMPLE BANDAGING.

A bandage is a strip of cloth of suitable width and length that can be applied snugly to some part of the body. The emergency chest of each home ought to contain a supply of bandages of various sizes.

Bandages serve the following purposes:—

1. Protection.
2. Application of dressings.
3. Fixation of splints and other apparatus.
4. Prevention of motion.

Size and Material.

There may be great variation both in the width and length of bandages, according to the purpose required; but for general use, we can recommend the following sizes:—

Finger bandages, one inch wide, and one to two yards long.

Arm and head bandages, two and one-half inches wide, and three to six yards long.

Leg bandages, three inches wide, and four to eight yards long.

Trunk bandages, four to six inches wide, and six to twelve yards long.

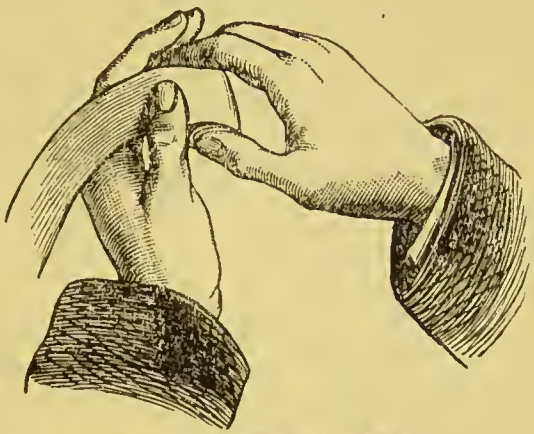


Fig. 125. Rolling the Bandage.

Ordinarily, the best material consists of old, clean muslin or linen, but calico, flannel, and mackintosh may also be utilised for special purposes, the latter serving to prevent evaporation.



Fig. 126. Single-Headed Bandage.

Rolling Bandages.

Special rolling machines are usually provided for hospitals, but they are not necessary. To roll a bandage, double the strip of cloth once or twice, and then, after starting the roll, hold it in the right hand between the thumb and first finger, as illustrated in Fig. 125, letting the strip pass between the thumb and first finger of the left hand. If rolled into one roll or "head," it is called a simple or single-headed bandage (Fig. 126); if into two rolls, a double-headed or compound bandage. Fig. 127.

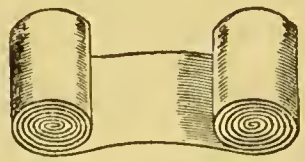


Fig. 127. Double-Headed Bandage.

Varieties.

Our space forbids mentioning more than a few of those most commonly used.

The triangular bandage is simplicity itself, for it merely consists of a piece of muslin about three or four feet square, folded once so as to make a triangle. It is useful as a temporary bandage for the head or breast, or as a sling for the arm.

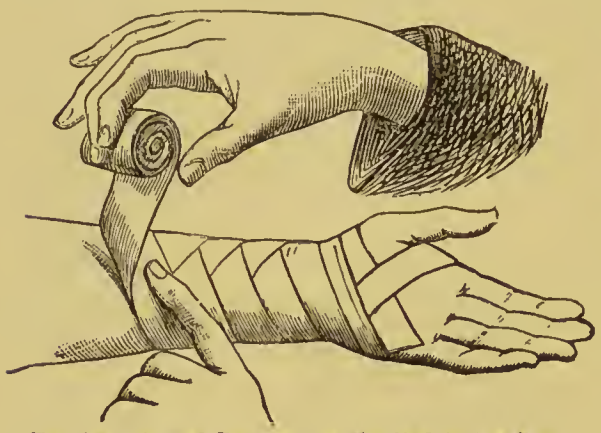


Fig. 128. Spiral-Reverse, as Applied to the Arm.

A spiral bandage may consist of plain, circular turns, each overlapping the preceding for half an inch or more. But in bandaging the limbs, on account of the constantly changing circumference, it is necessary to use reverses, as illustrated in Figs. 128 and 129. This variety of spiral bandage is known as the spiral reverse.



Fig. 129. Spiral-Reverse, Applied to the Leg.

The figure-of-eight is a very useful bandage for joints. After one or two circular turns to fix the bandage below the joint, carry it down the joint to the opposite side, and fix again by a circular turn. Then carry it below the joint from right to left, or left to right, as the case

may be, around the limb and up above the joint until the joint is well covered. Figs. 132, 134.

Head Bandaging.

A bandage two and one-half inches wide and three or more yards in length is most satisfactory. Fig. 130 illustrates one of the most simple forms, which is well adapted for bandaging wounds of the head. To apply it, pass several circular turns from the back of the head to the forehead. Then reverse the bandage in front of the ear, by turning it down, and fasten with a small safety pin. Continue the bandage under the chin and up in front of the other ear, and then over the crown of the head back to where the reverse was made. The circular turns may be repeated several times, after which the free end is fastened by a safety pin or a few stitches.



Fig. 130. Head Bandage.



Fig. 131. Arm Sling.

Bandaging the Arm.

Oftentimes all that is required in treating the arm is a sling, such as shown in Fig. 131. Take a piece of suitable cloth about forty-two inches square, and fold it once so as to make a triangle. Suppose the right arm is to be carried in a sling. Lay the arm upon the triangle so that the short end touches the elbow. The inner long end is brought up over the right shoulder, and the

outer long end over the left shoulder, and then the ends are tied behind. These steps are clearly indicated in the accompanying illustration.

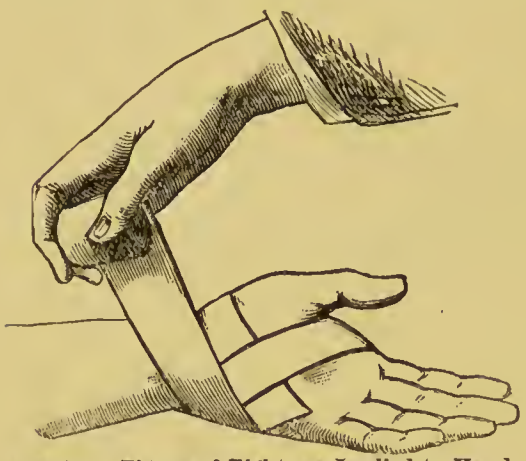


Fig. 132. Figure-of-Eight, as Applied to Hand.

To bandage the forearm, begin at the hand, say the left, and, placing the free end of a single-headed bandage in the palm of the hand, carry it outward around the wrist, and then across the free end inside the thumb, thus fixing it. The bandage is now carried up the arm in the form of spiral reverses, as illustrated in Fig. 128.

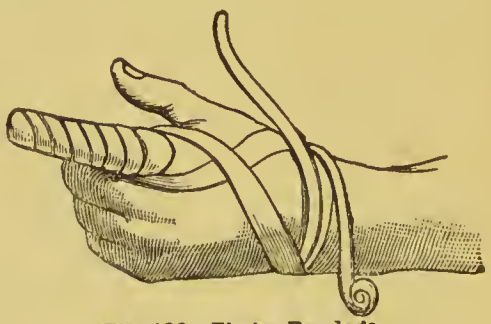


Fig. 133. Finger Bandage.

Hand and Finger Bandages.

A figure-of-eight makes a good bandage for the hand or wrist. Suppose the palm of the left hand is injured. After applying the dressing and a pad of absorbent cotton, place the free end of the bandage over the pad and carry it outward above the thumb and around the wrist, then across the palm, thus fixing the free end. The next step is to carry the bandage across the back of the hand to the inner side, up over the palm of the hand, and so on. Fig. 132.



Fig. 134. Figure-of-Eight, Applied to the Thumb.

To bandage the finger, pass one turn of the bandage about the wrist to fix it, then carry over the top of the finger, and by spirals inclose the finger snugly, finally carrying the bandage back to the wrist, where it is fastened. Fig. 133.

An effectual bandage for the thumb is a figure-of-eight. Fig. 134.

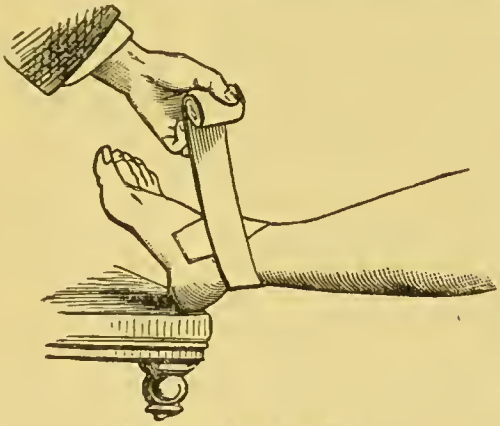


Fig. 135. Ankle Bandage.

Bandaging the Lower Extremity.

The spiral reverse makes a very good bandage for either the thigh or the leg. In applying it to the leg, begin with two turns about the foot, and then several turns of figure-of-eight to cover the ankle. Now carry it up the leg by reverses similar to those used in bandaging the arm. Fig. 129.

To bandage the ankle, place the free end on the inner side of the foot, carry the roller outward and behind the ankle, then across the free end, fixing it; then under the foot, up the inside, across to the outer side of the ankle, etc. Fig. 135.



Fig. 136. Strapping the Foot.

To strap the foot or ankle, use adhesive plaster bands, beginning at the lower point, and ascending. Each band overlaps the one below. See Fig. 136.

Strapping makes a good treatment for sprains, but, as a rule, a bandage is preferred because it is more easily removed, thus favouring cleanliness.

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